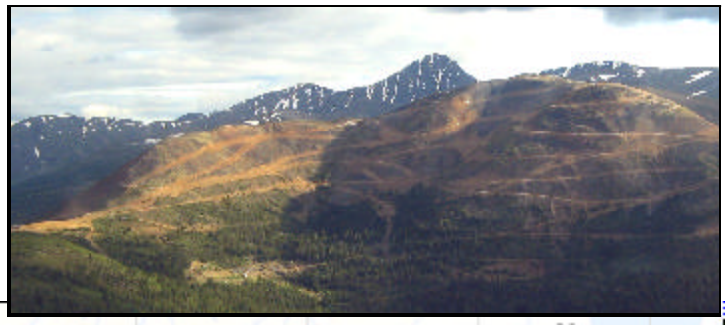
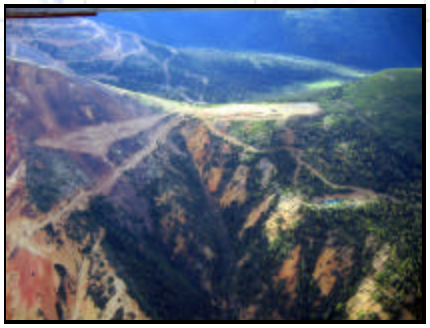


TINTINA MINES LTD.

Red Mountain Porphyry Molybdenum Deposit Underground Exploration Project

License and Permit Application 2005/2006 Yukon Territory



Prepared by:

ACCESS CONSULTING GROUP

Yukon Engineering Services

October 2005

Tintina Mines Ltd.

Red Mountain Project

Yukon Territory

Submitted by:

Tintina Mines Ltd.
Suite 700, Box 24
220 Bay Street
Toronto, Ontario
M5J 2W4

DISTRIBUTION LIST

8 Copies + 10 CD's*	Government of Yukon Energy, Mines & Resources, Minerals Management Branch
10 Copies + 1 CD	Government of Yukon, Energy, Mines & Resources, Lands Branch
1 Copies + 1 CD	Government of Yukon, Yukon Water Board
1 Copy + 1 CD	Teslin Tlingit Council
1 Copy + 1 CD	Access Consulting Group
1 Copy + 1 CD	Yukon Engineering Services Inc.
6 Copies + 1 CD	Tintina Mines Ltd.

*CD will be PDF version of report

PROJECT CONTACT LIST

TINTINA MINES LTD. Suite 700 Box 24 220 Bay Street M5J 2W4 Tel: (905) 479-5072 ext.226 Fax: (905) 479-6397	**Contact: David Wahl, P. Eng., P.Geo.** **Project Coordinator** Email: david.wahl@inter-citic.com
ACCESS CONSULTING GROUP # 3 Calcite Business Centre 151 Industrial Road Whitehorse, Yukon Y1A 2V3 Tel: (867) 668-6463 Fax: (867) 667-6680 Website: www.accessconsulting.ca	**Contact: Rob McIntyre, R.E.T., CCEP** **Permitting and Regulatory Manager** Email: rob@accessconsulting.ca
YUKON ENGINEERING SERVICES INC. #1 Calcite Business Center 151 Industrial Road, Whitehorse, Yukon Y1A 2V3 Tel. (867) 668-2000 Fax (867) 667-2220 Website: www.yes.yk.ca	**Contact: Rob Harvey** **Engineering Manager** Email: rharvey@yes.yk.ca
GOVERNMENT OF YUKON Development Assessment Process Branch Environmental Assessment P.O Box 2703 Whitehorse, YT Y1A 2C6 Tel: (867) 456-3963 Fax: (867) 393-6229	**Contact: Derek Fraser, Manager** **Project Assessment** Email: derek.fraser@gov.yk.ca
GOVERNMENT OF YUKON Department of Energy, Mines & Resources 400-211 Main Street Whitehorse, Yukon Tel: (867) 667-3422 Fax: (867) 667-8601	**Contact: Kevin Brewer, MBA, P.Geo.** **Project Coordinator** Email: kevin.brewer@gov.yk.ca

Waters Act **Schedule 4 Application**

If Amendment or Renewal: Licence # N/A

1. NAME: Tintina Mines Ltd.

2. PERMANENT MAILING ADDRESS:
PO Box 130 477 Don Mills Road Toronto Ontario

TELEPHONE: (416) 386-3042 FAX: (416) 386-0019 EMAIL:

3. SEASONAL MAILING ADDRESS (if different from permanent) From _____ (Date) to _____ (Date)

TELEPHONE: FAX:

4. LOCATION OF UNDERTAKING:

WATER SOURCE: Boswell River Tributary of Teslin River

WASTE DEPOSIT: Please see Figure 5 of the Report. A waste deposit is not expected. (Describe location, attach map, indicate location of waste deposit)

5. QUANTITY OF WATER TO BE USED: 300 or less m^3/day 6. PROPOSED EXPIRY DATE: 2007

7. TYPE OF UNDERTAKING
- Industrial ☐
- Placer Mining ☐
- Quartz Mining ☑
- Municipal ☐
- Power ☐
- Agriculture ☐
- Conservation ☐
- Recreational ☐
- Miscellaneous (attach description) ☐

8. WATER USE:
- To obtain water ☑
- To divert water ☐
- To store/alter flow of water ☐
- To modify the bed or bank of a watercourse ☐
- To cross a watercourse ☐
- To deposit waste ☑
- Other (attach description) ☐

9. OTHER PERSONS OR PROPERTIES AFFECTED BY THIS UNDERTAKING (attach list)
10. NAME, ADDRESS, TELEPHONE AND FAX NUMBER OF AGENT OR ALTERNATE CONTACT

Signature _____ Date _____

FOR OFFICE USE ONLY

Application Fee Amount _____ Receipt No: _____

Water Use Deposit Amount _____ Receipt No: _____

MLUR Amount _____ Receipt No: _____

Yukon Water Board
106-419 Range Rd. Whitehorse YT Y1A 3V1
Phone (867) 456-3980 Fax (867) 456-3890
email: ywb@yukonwaterboard.ca
www.yukonwaterboard.ca

Information Sheet for Quartz Mining Undertakings

A. GENERAL INFORMATION

1. Name of Applicant: Tintina Mines Ltd.

2. Are you applying for a Type A Licence or a Type B Licence? Type A ( ) Type B (X)

3. If you are applying for a Type B Licence, confirm that every aspect of your proposed undertaking does not exceed the licensing criteria specified in Column III of Schedule VII of the *Waters Regulation*.

4. Name of Waterbody(ies): Boswell River, Silco Creek, Red Mountain Creek (Please see Report for more details).

5. Tributary of: Teslin River Please see Report for details (Figure 6)

6. a) National Topographical System (NTS) 1:50,000 scale Map Sheet Number(s):
105C/13, 105C/14, 105D16, 105E/01, 105F/03, 105F/04

b) Indicate your project location on a 1:50,000 topographical map, or part thereof. Please ensure that the map sheet number is clearly indicated, selected UTM grid lines are labeled and the UTM zone is indicated.
Please see Report Appendix III – Figure B-3

c) Attach a copy of the claim map for the project area and outline your claims.
Please see Report Figure 12 – Land Use

7. Provide map co-ordinates for the project. If the project covers an area, provide the co-ordinates for a box that includes the entire project as well as the co-ordinates of the centre of the project area.

Minimum Latitude 60º 58’ 35.04”N Maximum Latitude 61º 1’ 21.5” N
Minimum Longitude 133º 41’ 32.02” W Maximum Longitude 133º 46’ 59.W
Centre Latitude 60º 59’ 58.7” N Centre Longitude 133º 44’ 14.32” W

8. Nearest Community: Teslin

9. Name of Highway and Kilometer Location: South Canol Road Kilometer 45

10. In which First Nation Traditional Territory (or Territories) is your project located?
Teslin Tlingit Traditional Territory

11. Is your project located on or near First Nation Settlement Land? Yes (X) (near) No ( )

Will water flowing from your project flow on or adjacent to First Nation Settlement Land? Yes (X) No ( )
If so, provide details and attach a map showing the Settlement Lands in relation to your project. Please see Report for more details (Figure 12). There will be no effects on quality or quantity of water flowing onto adjacent Settlement Lands.

12. Have you contacted the First Nation(s) regarding your project? Yes (X) No ( )
If so, provide details. Please see Report – Public Consultation Section 6.0

13. Are there any existing licences or pre-existing applicants whose use of water may be affected by your project? Yes ( ) No (X)
If so, provide information about who they are and any contacts that you have made with them.

14. Are there any other surface water or groundwater users that might be affected by your project? Yes ( ) No (X)
If YES, identify the other users and describe how they will or may be affected.

15. Does the undertaking require any other permits (e.g. land use permit, quarry permit, timber permit, etc.)? Yes (X) No ( )
If YES, specify the type of permit and it's status.
Mining Land Use Authorization Class 4 - (Application submitted October, 2005
Land Use Permit Class A - (Application submitted October, 2005

B. PROJECT DESCRIPTION

16. Provide a general description of the project. Please see Report – Project Scope Section 3.0

17. Is this a new undertaking or a reactivation of a previous operation?
The project is a reactivation of a previous operation. Please see Report – Project Background Section 2.0

18. Indicate the status of the mine and/or mill (or other relevant processing facility) on the date of the application:
The advanced exploration project is in the design stage. There is no processing facility to be located on site. Please see Report Section 4.1 for the project schedule.

19. If a change in the status of the mine or the mill is expected, please indicate the proposed date of such change(s). N/A. Please see Report - Project Schedule – Section 4.1.

20. Indicate the proposed operating schedule:
Advanced exploration decline development:
Hours per day: 20
Days per week: 7
Number and length of shifts: 2 x 10
Number of workers on site: There will be approximately 40 workers onsite.

21. Attach an overall project layout plan at a scale not less detailed than 1:5000 showing the locations of all of the main components of the project, including but not limited to the mining claims, mine, mill, rock dump(s), ore stockpile(s), dam(s), tailings area(s), access road(s), camp(s), water supply source(s), waste discharge(s) and any other facilities proposed to be licenced through this application. Indicate any Settlement Land and the location of other users identified in Part A if they are within the area of the map.
Please see Report Figures: 2, 3, 4, 5, 6 and Appendix III – Figure B-2 and B-3

22. Describe the type(s) of mining operation(s) proposed (i.e. conventional underground, conventional open pit, combined conventional underground and open pit, strip mining, etc.). Include in the description the mining methods to be used, the magnitude of each operation in terms of tonnes of ore and waste to be removed per day on average. Indicate any seasonal operation.
Please see Report Section 4.0 - Summary of Proposed Development

23. Does your site include any existing underground workings?
Yes ( ) No (X)
If so, describe them and provide drawings showing the location and extent. Do the workings free-drain? If so, describe the quantity and quality of the existing flow.

24. Specify the proposed milling rate in tonnes of ore per day: N/A

25. Describe the proposed milling and processing operation, including methods, equipment, reagents, etc. Provide a flow chart of the operation. N/A

26. Generally characterize the project by providing at least the following information:

a) Topographic maps: copies of the most recent and largest scale (up to 1:2000) topographic maps available, showing where the mine, mill, tailings and other related facilities will be located. Please see Report Figure 4 and 5

b) Soil maps: copies of the most recent and largest scale (up to 1:2000) soil maps available of the project area complete with legends and explanations. Soil maps are not available for this area. Soil characterization and analysis will be completed as part of the Fall Geotechnical Program (Please see Report Section 4.4.4).

c) Geologic maps: copies of the most recent and largest scale (up to 1:2000) geologic maps available of the project area complete with legends and explanations. Please see Report Section 5.1.1 and Figures 4, 7, 8, and 9.

d) Climate: climatological information, including precipitation and evaporation data for the project area. The climate in the Pelly Mountains Ecoregion is cold and semiarid with a mean annual temperature of –3.0 degrees Celcius (°C). The summer mean temperature is 10.5°C and the winter mean for the ecoregion is –17.5°C. Mean annual precipitation ranges from 500 – 1000 mm, varying with elevation.

A meteorological station was installed at the site in July 2005. This station collects data on rainfall, air temperature, soil temperature, barometric pressure, wind speed, solar radiation, and relative humidity. Information from the meteorological station will be downloaded in the Fall of 2005 and again periodically throughout the duration of the project.

e) Hydrology: hydrologic information for the project area, including peak flows, average flows, seasonal flows, flood flows and their return periods, flow patterns, seasonal water quality and quantity, and stream sediment data. Please see Report Appendix III for stream flows and baseline water quality studies.

f) Information pertaining to groundwater in the project area, including location, flow direction(s) and quality. Information on groundwater will be collected as part of the fall Geotechnical Program (Please see Report Section 4.4.4).

g) Information pertaining to the distribution and nature of permafrost in the project area, including any areas where your assessments indicate the potential existence of ice-rich, thaw unstable permafrost. Information on permafrost will be collected as part of the fall Geotechnical Program (Please see Report Section 4.4.4).

C. GEOLOGY AND GEOCHEMISTRY

27. Describe the physical nature of the ore body(ies), including location, known dimensions and approximate shape. Include separate descriptions of any recognized ore types and waste rocks within the ore bodies. Please see Report Section 5.1.1 and Figures 4, 5, 7, 8 and 9.

28. Describe the country rock in the vicinity of the ore body, paying particular attention to any rocks that will be excavated during mining or will remain in pit walls or workings. Please see Report Section 5.1.1.

29. For each country rock unit, waste rock unit or ore type, describe the mineralogy of the unit, listing the constituent minerals and their average percentage weights. If available, provide summary chemical analysis of the rock types, including trace elements.
Please see Report Section 5.1.1.

30. Are pyrite and/or pyrrohotite present in the ore body, waste rocks or country rocks? Yes (X) No ( )
Is arsenopyrite present in the ore body, waste rocks or country rocks? Yes (X) No ( )

If YES, be sure that the response to Question 29 indicates the amount of each mineral. Describe the grainsize and habit of the mineral (i.e. disseminated, veinlet, etc.). If any parameter is variable, then provide the range and average of the parameter. If the response to Question 30 is YES, then provide for each rock type and ore, any results for Acid Base Accounting, paste pH or other static/kinetic testing available. Please see Appendix I of the Report for ARD laboratory results. Please see Table 6 of the Report for estimated volumes of waste rock and Section 4.4.1 and Table 5 for potential grainsize of materials.

31. Is there a potential for acid rock drainage to occur? Yes (X) No ( )
If YES, describe the location, extent and degree of any anticipated acid rock drainage, including from waste rock, and the methods proposed to be used to minimize or mitigate any significant adverse environmental impacts. If NO, provide a technically based analysis, supported by site-specific data, that justifies the conclusion.

Please see Report Section 4.4.2 and Figure 5. More information on potential acid rock drainage will be submitted with the fall Geotechnical Program and once decline design is complete.

D. USES

32. Does the project include Direct Water Use? Yes (X) No ( )

If YES, attach the following information for each source:
There is the possibility that the Decline will intersect groundwater. Please see Report Section 4.2 for detailed information on project water use.

a) a description of the water use and source.
b) the acquisition rate in cubic metres per day and cubic metres per year.
c) a description of the location the water source(s). If the source is groundwater, attach well logs.
d) the water intake method.
e) details of any screening to exclude fish.
f) the location and design of any water storage facility, if applicable, and the water storage volume in cubic metres.
g) streamflow data in cubic metres per second for the water supply source, including:
i) Mean Annual Flow
ii) Mean Seasonal Flow
iii) Minimum Summer Flow
iv) Minimum Annual Flow
v) Mean Annual Flood
vi) Maximum Summer Flood
vii) Mean Summer Flood

33. Does the project include Construction of a Watercourse Crossing? Yes ( ) No (X)
If YES, attach the following information for each crossing:

a) a description of the type of crossing (i.e. bridge, culvert, rock drain, ford, etc.).
b) an explanation of why the crossing is required and the rationale for selection of the type of crossing.
c) the following information for the crossing location:
i) the width of the watercourse at the Ordinary High Water Mark (OHWM).
ii) the gradient of the watercourse.
iii) the Design Flood Flow in cubic metres per second and its Return Period.
iv) the Mean Seasonal Flow in cubic metres per second
v) an explanation of the rationale for the selected Design Flood Flow and its Return Period.
vi) a description of the streambed material, streambank material and streambank vegetation.
vii) a description of proposed sediment control measures.
viii) design drawings in plan and profile.
ix) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used.

34. Does the project include Watercourse Training? Yes ( ) No (X)

(includes channel and/or bank alterations, watercourse infilling, spurs, docks, culverts, erosion control, rip-rap, etc.) There will be only winter access to the site at this stage.

If YES, attach the following information for each proposed training work:

a) a description of the type of watercourse training proposed.
b) an explanation of why the training is required.
c) the following information for the watercourse training location:
i) the Design Flood Flow in cubic metres per second and its Return Period.
ii) the Mean Seasonal Flow in cubic metres per second.
iii) an explanation of the rationale for the selected Design Flood Flow and its Return Period.
iv) a description of the streambed material, streambank material, and streambank vegetation.
v) a description of the source, size, and composition of any material to be used for the training and the quantity of material to be either placed into or removed from the watercourse.
vi) a description of proposed sediment control measures.
vii) design drawings in plan and profile.
viii) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used.

35. Does the project include Diversions? Yes ( ) No (X)
(includes dikes and other structures relating to the diversion)

If YES, attach the following information for each diversion and related structure:

a) the width of the pre-diversion watercourse at the Ordinary High Water Mark (OHWM).
b) a description of the proposed diversion or structure.
c) an explanation of the reason for the diversion or structure.
d) information on the length and gradient of the existing channel and of the proposed diversion.
e) the following information for the diversion:
i) the Design Flood Flow in cubic metres per second and its Return Period.
ii) the Mean Seasonal Flow in cubic metres per second.
iii) an explanation of the rationale for the selected Design Flood Flow and its Return Period.
iv) design drawings in plan and profile.
v) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used.

36. Does the project include Waste Rock Dumps or Ore/Concentrate Storage?
Yes (X) No ( )
Please see Report Section 4.4.2 and Figure 5. Information on rock, soil, and permafrost conditions will be collected during the fall geotechnical program Section 4.4.4 of the Report.

If YES, attach the following information for each contiguous dump:

a) a description of the proposed dump site, including location and extent, topography, soil and rock conditions (provide test pit/drill hole logs and laboratory test results), permafrost conditions, geologic and hydrologic characteristics, rock types and amounts to be placed in the dump, physical and chemical quality of rock to be placed in the dump, and the quantity and quality of surface runoff and seepage through the dump to surface water and groundwater.

b) a description of the methods proposed to be used to ensure stability of the dump and avoid, minimize or mitigate significant adverse environmental impacts, including, but not limited to, site preparation, methods of rock placement, operating and final slopes, caps and crowns, seepage collection or interception ditches, sediment control measures, revegetation/reclamation measures, and monitoring of stability and seepage.

c) design drawings in plan and profile.
d) a description of the site preparation, construction methods, schedule, proposed quality assurance/quality control measures, inspection and maintenance procedures, and schedule.

37. Does the project include Dams, Spillways, Cofferdams or Dikes? Yes ( ) No (X)

If YES, attach the following information for each structure:
a) a description of the structure and its purpose.
b) a description of the site conditions, including the location, topography, geologic and hydrologic characteristics, permafrost conditions, and soil and rock conditions (provide test pit/drill hole logs and laboratory test results).
c) a description of the type and composition of the material to be used in the construction of the structure.
d) design drawings in plan and profile.
e) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used.
f) in the case of a dam, details of the seismic design parameters and confirmation that the structure is designed to withstand the Maximum Credible Earthquake.
g) in the case of a spillway, details of the hydraulic design parameters and confirmation that the structure is designed to pass the Probable Maximum Flood.
h) If the structure creates a reservoir in a natural watercourse, attach drawings of the reservoir in plan and profile and show representative cross sections. Identify the size of the drainage basin upstream of the reservoir and provide a topographic plan showing the drainage area boundary. Indicate the number of hectares to be flooded, the surface area of the reservoir at full supply level, the total storage capacity of the reservoir, and details of any shoreline protection proposed.

38. Does the project include the Deposit of Solid or Liquid Waste? Yes (X) No ( )
(Note: This includes all wastes as defined in Section 1 of the *Waters Act* that have the potential to alter or degrade surface or groundwater. Wastes include but are not limited to tailings, milling residues, runoff from mine workings and tailings, discharges from workings, explosives residues, debris, domestic sewage, sediment, etc, whether treated or not.)

If YES, attach the following information for each liquid waste:

a) the type and quantity of waste proposed to be deposited and the reason for the deposit.
No discharge planned. Please see Section 4.2 (Water Use and Wastewater Summary).
b) in the case of a liquid waste, the chemical characterization and concentration of the waste proposed to be deposited.
No discharge planned. Please see Appendix I for Leachate Test results for Potentially Acid Generating Waste Rock.
c) in the case of a solid waste, the geochemical characteristics of the waste.
Please see Figure 5 for proposed locations of Waste Rock Storage Areas. Section 5.1.1 contains waste rock geochemical characterizations.
d) the location, rate, timing, frequency and duration of the deposit.
No liquid discharge planned. See section 4.2 (Water Use and Wastewater Summary).
e) the baseline surface and groundwater quality at the location of the proposed discharge.
No discharge planned. See Appendix III for surface water quality characterization of Boswell River at Monitoring Station TM-06.
f) the potential qualitative and quantitative effects that the deposit may have on any watercourse and/or surface water and/or groundwater.
No discharge planned. See section 4.2 (Water Use and Wastewater Summary).
g) the proposed methods for collecting, storing, treating and discharging the waste, and the volumes of any waste storage systems.
No discharge planned. See section 4.2 (Water Use and Wastewater Summary).
h) a description of the construction methods, schedule, quality assurance/quality control measures, and inspection and maintenance procedures and schedule proposed to be used for any waste treatment/storage/discharge facilities.
See section 4.2 (Water Use and Wastewater Summary).
i) a description and justification of the standards proposed to be applied to any discharges of waste to the receiving environment.
No discharge planned. Unplanned discharge will meet pertinent Metal Mining Effluent Regulation standards.

E. HAZARDOUS MATERIALS AND SPILL CONTINGENCY

39. Does the project include the Handling or Storage of Petroleum Products or Hazardous Materials? Yes (X) No ( )

If YES, provide the following information:
a) a plan for the safe handling, storage, and disposal of petroleum products or hazardous materials.
Please see Report Appendix II (Spill plan will be updated once project details and contractors are complete).

b) a description of equipment to be kept available for spill response or other emergency and it's location, and a description of proposed training programs for workers.
Please see Report Appendix II

c) a contingency plan for the containment and clean-up in the event of a spill.
Please see Report Appendix II

F. EMERGENCY RESPONSE

40. Provide an emergency response plan that includes mechanisms and processes for addressing potential or actual failures of structures, equipment and material stockpiles, and programs for appropriate training to workers.
An emergency response plan will be submitted once project details and contractors are confirmed.

G. WATER BALANCE MODEL

41. Provide the analysis and results of a detailed water balance model for the project, including all assumptions, calculations and findings, including wet and dry events modelled. Water use volumes are included in Section 4.2 of the Report. There will be no deposit of waste.

H. WATER QUALITY MODEL

42. Provide the analysis and results of a predictive water quality model for the project.
See above (G).

I. PROJECT EFFECTS

43. Provide a description of any potential impacts to fish and fish habitat.
Please see Report Section 5.2.4 and Appendix III

44. Provide a description of plans to mitigate any effects on fish resources.
Please see Report Section 7.3.2

45. Provide a description of plans for compensation of any fish habitat lost due to the project. Please see Section 5.2 and Appendix III. DFO has been contacted regarding compensation for loss of fish habitat and has stated that it is not required for this project.

46. Provide a description of wildlife uses in the project area including sport hunting, subsistence hunting, trapping, and non-consumptive uses.
Please see Report Section 5.1.5 and Appendix III

47. Provide a description of plans to mitigate any effects on wildlife resources due to the project.
Please see Report Section 7.3.1.1

48. Provide a description of plans to mitigate any damage to plant cover and topsoil.
Please see Report Section 7.3.1

49. Provide a detailed description of any potential impacts to water quality, quantity and/or seasonal rate of flow, and any mitigative measures included in the project design.
Please see Report Section 4.2.

50. Are there anticipated to be any potential impacts to traditional uses and water rights of a First Nation as described in Section 14.8.0, or of a Yukon Indian Person as described in Section 14.9.0 of the *Umbrella Final Agreement*? Yes (X) No ( )

If YES, provide an explanation of how they have been considered and what mitigative measures have been included in the project design.

Mitigation measures are included in the Report in Section 7.0. There will be no impact downstream to quality or quantity of water following mitigation measures.

51. Provide an explanation of how any existing water use licensees or pre-existing applicants, whose use of water may be affected by your project, have been considered and what mitigative measures have been included in the project design. There are no pre-exisiting applicants or existing water use licensees in the project area.

52. Are there any trapline concession holders in the area of your project? Yes (X) No ( )
If YES, provide information about who they are, what contacts that you have made with them, how they have been considered in the project development, and what mitigative measures have been included in the project design.
Please see Report Appendix III and Figure 12.

53. Are there any outfitters in the area of your project? Yes (X) No ( )
If YES, provide information about who they are, what contacts that you have made with them, how they have been considered in the project development, and what mitigative measures have been included in the project design.
Please see Report Appendix III and Figure 12.

54. Are there any other owners or occupiers of land in the area of your project? Yes ( ) No (X) If YES, provide information about who they are, what contacts that you have made with them, how they have been considered in the project development, and what mitigaive measures have been included in the project design.

J. DECOMMISSIONING PLANS

55. What is the expected life of the project? Approximately 2 years.

56. Provide a detailed description of decommissioning measures to be taken when the project is either temporarily or permanently abandoned and describe how project facilities will be removed and the site reclaimed. Please see Report Section 7.3.6

57. Provide a description of proposed monitoring and inspection procedures to be followed during either temporary or permanent decommissioning. Please see Report Section 7.3.6 and 7.3.7.

K. MONITORING PLANS

58. Provide a detailed description of the methods, procedures, standards, systems, networks and schedules proposed to be used to monitor the performance of the project facilities/systems and their impact on the environment.
Please see Report Appendix III for Baseline studies. Water quality stations will be tested throughout the project.

OFFICERS OF THE COMPANY/CORPORATION
This page must only be completed if the applicant is a corporation, limited company, or other
business entity. Non profit organizations should provide proof that they are a registered society or
organization in the Yukon.

Before issuing a water licence in the name of a corporation, limited company or other business
entity, the Yukon Water Board will require that the following declaration be completed:
I, _____ certify that (name of business entity)
_____
is incorporated or registered pursuant to the *Business Corporations Act* Of The Yukon Territory
or is registered in the province of _____.
The officers of the company are:
Name (Please Print): Title

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
Signature Title

_____
Date
Please Note: If the above information is not completed, the Board will consider the application to
be in the name of the individual who signed the Schedule IV.
In addition to this declaration, proof that the business entity is allowed to do business in the
Yukon is required. Please attach an annual return, Form 1-04, or certificate of Registration.

Yukon
Energy, Mines and Resources

TERRITORIAL LAND USE REGULATIONS
APPLICATION FOR LAND USE PERMIT

ACCESS TO INFORMATION & PROTECTION OF PRIVACY ACT

This information is being collected under the authority of the *Lands Act, Territorial Lands (Yukon) Act* , and Yukon *Environmental Assessment Act* to be used for the purpose of reviewing the request for land and any potential approvals as may be required. This information is about the conduct of public business and it cannot and will not be kept confidential. Except as noted below, it will be shared with other government departments and will be treated as information that third parties have the right to under the Access to Information and Protection of Privacy Act. Your phone number and address and business plan information will be treated as confidential, but might still be disclosed as permitted or required by the Access to Information and Protection of Privacy Act. (There are cases where even confidential information can be disclosed).

OFFICE USE ONLY

Application Fee	Land Use Fee	General Receipt #
Date	Class	Permit #

TO BE COMPLETED BY ALL APPLICANTS

General Information

Applicant Name		Business Phone	Home Phone
Tintina Mines Ltd.		(416) 386-3042	
Business Fax	**Home Fax**		
(416) 386-0019			
Applicant Address	**City/Town**	**Territory/Province**	**Postal Code**
PO Box 130 477 Don Mills Rd	Toronto	Ontario	M5J 2W4
Contractor's/Supervisor's Name		**Business Phone**	**Home Phone**
Rob Harvey		(867) 668-2000	
Business Fax	**Home Fax**		
Contractor's Address	**City/Town**	**Territory/Province**	**Postal Code**

Other Personnel (Subcontractor, contractors, company staff, etc.)

Rob McIntyre - Access Consulting Group (867) 668-6463

Application/Project Description

Describe purpose, nature and location of all activities - refer to Section 21(2)(b) - *Territorial Land Use Regulation*. Attach additional pages if necessary.

Please see Advanced Underground Exploration - License Permit Application - October 2005 (Report) for details on the proposed project.

Please indicate if a camp is to be set up. Attach additional pages if necessary.

A camp will be used for the mobilization of mining equipment and decline development. Please see Report Section 4.5 for details on camps.

Equipment Attach additional pages if necessary.

Type & Number	Size	Proposed Use
Please see Report	Section 4.3.1 for equipment details.	

Fuels Attach additional pages if necessary.

Fuel Type	Number of Containers	Capacity of Containers
Diesel	Section 4.3.1 for fuel details.	

Fuel Containment

Containment fuel spill contingency plans (Please attach separate contingency plan if necessary):

Please see Appendix II in the Report. A detailed Fuel Spill Contingency Plan will be submitted once contractors are finalized.

Method of fuel transfer (To other tanks, vehicles, etc.):

Electric pumps will be used for fuel transfer.

Proposed Disposal Methods

a) Garbage:

Garbage will be incinerated onsite.

b) Sewage (Sanitary & Grey Water):

Please see Report Section 4.2

c) Brush & trees:

Cleared brush and trees will be burned.

d) Overburden (Organic soils, waste material, etc.):

Disturbed areas will be recontoured and left for natural revegetation. Please see Report Section 7.3.6

Site Characteristics

SOILS (sand, gravel, clay, silt, peat etc):

Please see Report Section 5.0 for information on detailed site characteristics.

VEGETATION (spruce, pine, poplar, willow, clear etc):

As above

TOPOGRAPHY (flat, steep, rolling, etc):

The topography is rolling. Sections on Red Mountain are steep.

PROXIMITY TO WATER COURSES (rivers, streams, lakes, ponds within or near the application area)

Please see Figures 2 and 3 for site location and water courses.

Road Routes

☐ New road

☑ Existing road

Please provide details. Attach additional page if necessary.

Please see Figure 3 and Section 4.3 for winter route details. The route is mostly existing and will only be used in the winter at this stage of the project.

Has the route been laid out or ground truthed. ☑ Yes ☐ No

Potential Environment/Resource Impacts

Describe the effects of the proposed program on land, water, flora & fauna and related socio-economic issues. Attach additional pages if necessary.

The transport of equipment to the Red Mountain site will take place within a 2 month period and will use a mostly existing trail. The environmental effects are expected to be low. A fuel spill contingency plan is attached and will be used in the event of a fuel spill. Re-fueling of trucks will not take place within 30 meters of a waterbody or stream.
Please see Section 7.0 for proposed mitigation.

Proposed restoration plans.

Where possible, the vegetative mat will not be disturbed. If disturbed, the area will be recontoured and left for natural revegetation. All garbage and equipment will be removed from the site at the completion of the program.

Other rights, licenses or permits

Other rights, licenses or permits related to this permit application (mineral claims, timber permits, water licenses, etc.).

Class IV Mining Land Use Authorization
Type B Water License

LAND USE PLANNING & ZONING (Community Services Branch may provide assistance if current zoning information is not known – call 667-3530)

CURRENT ZONING APPLICATION LANDS: ☑ NONE ☐ URBAN RESIDENTIAL

☐ COUNTRY/RURAL RESIDENTIAL ☐ COTTAGE ☐ COMMERCIAL ☐ INDUSTRIAL

☐ OTHER:_____

NAME OF APPLICABLE COMMUNITY OR LOCAL AREA PLAN n/a

Period of Operation

Period of operation including time to cover all phases of project work applied for including restoration:

2 Years

Period of permit (up to two years, with maximum of one year extension);

2 Years

Start Date	Completion Date
January 2006	January 2008

Location 1st set	**2nd set (if applicable) - eg. road**
Lat Degree 61°1'51"N	Lat Degree 60°47'3"N
Long Degree 133°47'31"W	Long Degree 133°3'60"W
Map Sheet No.: 105C/13, 105C/14, 105F/04	Community: ~ 80 kilometers northeast of Whitehorse

SCHEDULE OF FEES:

☐ Class A $150.00 (+ $10.50 GST)
☐ Class B $150.00 (+ $10.50 GST) ▶ **$150.00**

1st 2 Hectares (automatic fee) ▶ **$ 50.00**
Total Land Use Combined Fees ▶ **$200.00.....$200.00**

Add $50.00 for each **additional** hectare
or portion thereof...._____ ha @ $50.00 ea ▶ $_____ (if applicable)
Add 7 % GS..... ▶ $_____
Total Land Use Fees..... ▶ $_____

☐ Land Use Permits within a Block Land Transfer: **$25.00**
+ 7% GST **$ 1.75**
Total **$26.75**

SIGNATURE – APPLICANT/OWNER CONSENT
I/we certify that all of the submitted information is true and correct to the best of my knowledge and belief.

I/we understand that any misrepresentation of submitted data may invalidate any approval of this application.

I/we confirm that, if approval is granted, all work or activities will be undertaken consistently as outlined in this application and in compliance with any terms or conditions as may be specified or contained in said permit.

Signature_____ Print Name_____

Date_____

OFFICE USE ONLY – APPLICATION CHECK LIST

Calculation of area involved (including access, staging areas, airstrips, campsites, etc.)

Total Area (Hectares)	Less the original 2 Hectares	TOTAL (for fee calculation)

☐ Application signed and dated ☐ Timber Permit applied for ☐ Fees attached ☐ Lease applied for ☐ Screening report

☐ Water license applied for ☐ Highways Permits applied for ☐ Map included ☐ Address and telephone number

Accepted by: _____ Date_____

Energy, Mines & Resources
Lands Branch, Land Use Section K-320
Whitehorse, Yukon Y1A 2B5
Phone: 667-3173 Fax: 667-3214

Clear Form Print Form

ACKNOWLEDGEMENTS

Access Consulting Group[1] (ACG) of Whitehorse, Yukon, has prepared this Project Description in conjunction with Tintina Mines Ltd. (Tintina) and Yukon Engineering Services Inc.

The following people contributed to the report or assisted with field surveys:

Tintina Mines Ltd.

J. Rassmuss *(President, CEO, Mining Engineer)*
D. Wahl (Director and Professional Engineer)
R. Spiegel (Director)
J. Orrego (Engineer)
M. Contreras (Engineer)

Access Consulting Group

R. McIntyre (Permitting and Regulatory Manager)
D. Cornett (Environmental Assessment Manager)
J. Taylor (Environmental Scientist)
S. Keesey (Environmental Scientist)
N. Speiss (Environmental Scientist)
D. Petkovich (Fisheries Biologist)
R. Ricks (Fisheries Biologist)
G. Lortie (Wildlife Biologist)
C. Thomas (Heritage Specialist)
G. Morberg (Teslin Tlingit Council)
P. Inglis (Mapping)
H. Desmarais (GIS Mapping)
C. MacMillan (Administrative)
N. Berndt (Administrative)

[1] Access Consulting Group is a registered trade name for Access Mining Consultants Ltd.

Yukon Engineering Services Inc.

R. Harvey (Engineering Manager)

E. Nyland (Project Engineer)

P. Percival (Project Engineer)

P. Knysh (Project Engineer)

G. Cooper (AutoCad Drafting)

Tintina would also like to acknowledge the helpful support from K. Brewer of the Government of Yukon and other staff in the Department of Energy, Mines & Resources.

TABLE OF CONTENTS

DISTRIBUTION LIST
PROJECT CONTACT LIST
LICENCE AND PERMIT APPLICATIONS

TABLE OF CONTENTS (Cont'd)

TABLE OF CONTENTS (Cont'd)

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

LIST OF APPENDICES

1.0 CORPORATE PROFILE

Tintina Mines Ltd. (Tintina) is a Canadian public company, which trades on the TVX Ventures Exchange. Tintina was founded in 1961 and focuses on mineral exploration in Canada.

The following introduces the Officers and Directors of Tintina:

Juan E. Rassmuss resides in Santiago, Chile, and is the President, Chief Executive Officer, and a Director of Tintina. Mr. Rassmuss is a Professional Mining Engineer with 50 years' experience. He has been the Chairman and Chief Executive Officer of Compania Explotadora de Minas (a Chilean holding company with control of producing mining properties and assets located in South America) since 1995.

W. Ross Abbott resides in Toronto, Ontario, and is Secretary, Treasurer and Chief Financial Officer of Tintina. Mr. Abbott is principal of an accounting practice in Toronto.

Francis O'Kelly resides in Lima, Peru, and is Vice President and Director of Tintina. Mr. O'Kelly is President of Mineral Consulting Services Ltd. (an engineering and geological consulting firm) since 1982.

Karl J.C. Harries resides in Gananoque, Ontario. Mr. Harries retired as a Partner of Fasken Campbell Godfrey of Toronto in 1991, but continued to advise that firm and its clients as Counsel until 2002. He is an Adjunct Professor at Queen's University where he teaches a course as part of the Minex Program of the Department of Geological Sciences & Engineering. During Mr. Harries' long and distinguished legal career his practice focused on corporate and commercial law with emphasis upon natural resource matters, particularly those relating to mining. Mr. Harries continues to consult on mining matters.

Robert N. Spiegel resides in Toronto, Ontario, and is a Director and Counsel for Tintina. Mr. Spiegel is a partner with the law firm of Stikeman, Graham, Keeley & Spiegel LLP, Toronto, Ontario, since February 2001. Prior to joining the firm, from September 1999 to February 2001, Mr. Spiegel was an associate at Fasken Martineau DuMoulin LLP. From November 1997 through August 1999 Mr. Spiegel was Counsel, Corporate Finance Services Department of the Toronto Stock Exchange.

David G. Wahl resides in Mount Albert, Ontario, and is a Director of Tintina and is the *Qualified Person* as defined by National Instrument 43-101 for the Company. Mr. Wahl is principal of Southampton Associates Inc., a private mineral consulting firm since 1995. A graduate of the Colorado School of Mines, with a degree of *Engineer of Mines* (1968), Mr. Wahl is a registered *Professional Engineer* in the province of Ontario (1970) and holds the designation of *Consulting Engineer* (1975) and has been designated *Specialist in Exploration and Development* by Professional Engineers Ontario. Additionally, Mr. Wahl is a registered *Professional Geoscientist* in the Province of Ontario (2002) by the Association of Professional Geoscientists of Ontario.

2.0 PROJECT BACKGROUND

2.1 PROJECT LOCATION AND HISTORY

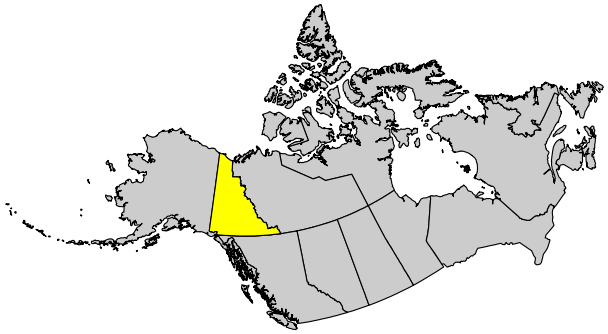
Red Mountain is located in south-central Yukon Territory, Canada. The proposed project is approximately 80 km north-east of Whitehorse (see Figure 1).

The property was initially discovered in the 1960's, drilled to deposit-class in the late 1970's and early 1980's, and now, under ownership of Tintina, the property is undergoing advanced underground exploration (note: no significant work has been conducted on the site since the 1980's). Tintina is 100% owner of the Red Mountain Claims.

The following project history is excerpted from *Geology and Mineralization of the Red Mountain porphyry molybdenum deposit south central Yukon* report by Brown and Kahlert (1986).

> *"Initial exploration within the area dates back to 1915 and concentrated on lead-silver showings within sedimentary rocks of the Yukon Cataclastic Complex. In 1966-1967, Boswell River Mines followed up reported occurrences of lead-silver veins near Red Mountain and staked the Fox and Star claims. Exploration within the Fox claim group, which covers the present Red Mountain property, initially consisted of an airborne survey (combined magnetic, radiometric and electromagnetic) in November 1967. In August 1968, a contour geochemical survey determined essentially coincident silver, lead, copper and molybdenum anomalies in the central and southeast part of the property. In addition, a winter road from the Canol Road to the property was constructed along with trenching and access road construction on the property. Between April and August 1969, two drills operated by Arctic Diamond Drilling Ltd. of Whitehorse, Yukon, completed a total of 3126 m of diamond drilling in 16 holes. This drilling was restricted to the eastern portion of the quartz monzonite porphyry and adjacent hornfels. The most significant intersection, in hole 69-F-1, assayed 0.084% MoS_2 over 52.8 m (unpublished company report by P.H. Sevensma, 1970). In December 1975, R.G. Hilker of Whitehorse restaked the property as the Bug claims and optioned them to Tintina Silver Mines who performed prospecting and hand trenching. Amoco Canada Petroleum Company Ltd. optioned the property from Tintina Silver Mines Ltd. in October 1977. During the following five years, Amoco conducted a comprehensive property evaluation consisting of geological mapping, geochemical and geophysical surveys and 21,391 meters of diamond drilling in 32 holes."*

Figure 1 presents a general location map of the Yukon Territory, while Figure 2 provides an overview of the project area.



ACCESS CONSULTING GROUP

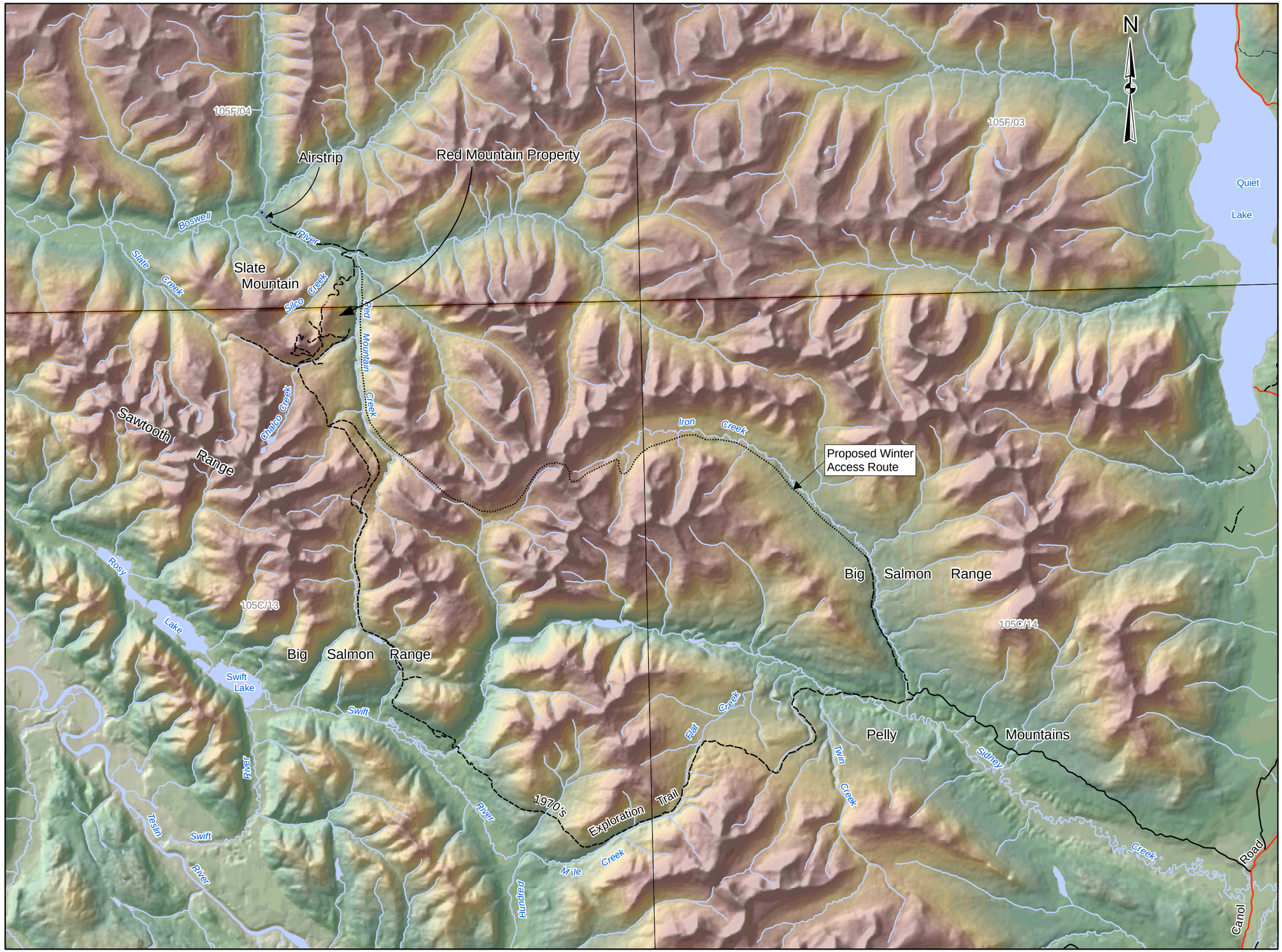
Red Mountain Project

Yukon Territory

Tintina Mines Limited

Drawn By: HD/PI	**Figure 1**
Checked By: RM	Date: Sept. 2005

Our file:D:\Project\AllProjects\TML-05-01\gis\mxd\Report2005\Fig1_Location.mxd



Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Legend

- Road
- Secondary Road
- Trail
- Proposed Winter Access
- Water Course
- Water Body
- Airstrip
- 105C/13 NTS Boundary and Number

Projection: UTM Zone 8 NAD83
Units: Meters
NTS Sheets: 105C/13, 105C/14, 105F/03, 105F/04

Project Area Overview

Figure 2

Scale: 1:150,000

0 1 2 4 6 km

ACCESS CONSULTING GROUP

Drawn by: HD/PI	Checked by: RM
Date: September 2005	

Our File: D:\Project\AllProjects\TML-05-01\gis\mxd\Report2005\Fig2_ProjectArea.mxd

2.2 CURRENT SITE CONDITIONS

Red Mountain[2] has an extensive gridwork of trails from over 21,000 m of diamond drilling conducted in the 1960's by Amoco Canada Ltd. Remaining materials from previous drilling is documented in Table 1 excerpted from a Phase II Environmental Site Assessment that was completed in 1997 by Public Works and Government Services Canada (PWGSC). Table 1 outlines the existing site components as identified by PWGSC, along with their assessment of potential environmental risks.

The Phase II environmental site assessment report by PWGSC (1997) stated that there was no evidence that additional problems such as erosion, slope failures, contamination of water courses, etc., have been caused from the original drilling activity.

[2] Red Mountain is also referred to as Slate Mountain.

Table 1 PWGSC Summary of Existing Site Conditions at Red Mountain Mine Site

ASSESSMENT COMPONENT	RISK	RECOMMENDATION
1. Building, Infrastructure, Equipment		
9 buildings	Aesthetic Concern	None
5 storage tanks	Aesthetic Concern	None
2. Non-hazardous Waste Materials		
core sample boxes	Aesthetic Concern	None
80 empty 205 L barrels	Aesthetic Concern	None
2 large piles of material (much of material remains useable)	Aesthetic Concern	None
3. Hazardous Materials		
3 locations with stained soils	Minor environmental risk at site; environmental risk off site	Leave as is
Residual fuel in 45 barrels	Environmental risk	Incinerate wastes
4 L container antifreeze	Minor environmental risk	Incinerate wastes
3 - 23 L pails of gear lubricant	Minor environmental risk	Incinerate wastes
Residual fuel (~2000 L) in 2 storage tanks	Environmental risk	Incinerate wastes
4. Water Quality		
Mine seepage - None		
Site drainage - Yes	Minor environmental risk	None
Receiving waters - downstream of Silco Cr. tributary	Minor environmental risk	None
5. Waste Rock Disposal Areas		
Waste rock - ARD potential	Minor environmental risk	None
6. Mine Openings - None		
7. Tailings - None		

Plate 1 Existing Core Preparation Buildings and Drill Core Storage Racks
This area was used for a camp during previous drill programs.

Plate 2 Existing Airstrip Approximately 10 kilometers Northwest of the Red Mountain Site.

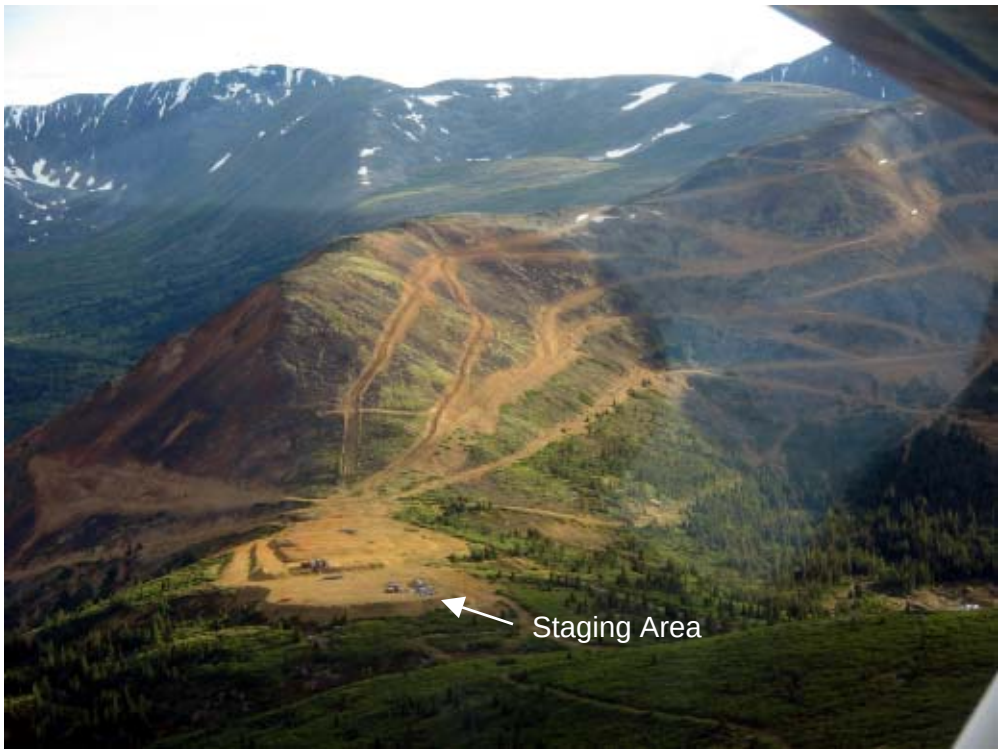


Plate 3 Existing Drill Roads On Red Mountain and Equipment and Fuel Storage Staging Area Looking West

There is an existing 72 km trail that connects the South Canol Highway to the project site. The road is in fair condition and has not been used for the project since the drilling program in the 1970's.

There is an existing airstrip located approximately 10 km northwest of the proposed project location (see Figure 2). The airstrip is currently used by an outfitter who operates in the area. The airstrip is in good condition and is capable of handling small fixed-wing aircraft; however, use may be limited to weather conditions. It will be used during decline development to transport supplies and crew to and from the site and for emergency response if needed.

3.0 PROJECT SCOPE

3.1 PROJECT SUMMARY

Tintina is planning to conduct an advanced exploration project on its Red Mountain porphyry molybdenum deposit in south-central Yukon.

The project description covers two stages of operation:

1. Mobilization of the mining equipment, camp supplies, and fuel to the project site; and
2. Development of a 3,200 m long decline to facilitate an underground exploration program (consisting of approximately 35,000 m of underground drilling, approximately 2,800 m of underground access development, and the collection of a 10,000 tonne bulk sample for further metallurgical testing).

Tintina will mobilize the mining equipment to the site in January/February 2006 and it is expected to take approximately two months.

The proposed decline development will commence in April 2006 to enable an underground drilling and bulk sampling program. The proposed underground exploration program is designed to enhance the company's geological understanding of the deposit, as well as to enable rock mechanics and metallurgical studies of the ore to support engineering and economic evaluations. The decline development is expected to take approximately six months.

Tintina is anticipating utilizing a tunnel boring machine (TBM) for all or part of the decline development; however, geotechnical evaluation of rock conditions and economic considerations may dictate the use of conventional drilling and blasting for portions of the decline. The underground development cross cuts and drifting will be accomplished by conventional drilling and blasting mining methods.

3.2 REGULATORY APPROVALS

The project will require the following permits and approvals:

- Class IV Quartz Mining Land Use approval for the development of the decline, camp, and road work on claims;
- Class A Land Use Permit for the winter access along Iron Creek; and
- Type B Water Use Licence for potential dewatering of the decline and handling rock once it reaches surface.

There are a number of minor permits, licenses, and guidelines under various legislation that may be required for this project and will be applied for as appropriate. For example, these may include:

- Storage Tank Systems Permit;
- Burning Permit;
- Guidelines for Canadian Drinking Water Quality Health Criteria; and
- Explosives magazine permit.

The following permitting strategy and timeline (Table 2) has been reviewed and accepted by the pertinent Government of Yukon agencies.

Table 2 Red Mountain Proposed Permitting Strategy and Timeline

	Project Activity	Licence/Permit Required	Submission Date	Approval Expected
Phase I	**1. Geotechnical** program (diamond drilling and R.C.) **2. Mobilization** of drills/camp on Amoco winter road	-Land Use Permit Class A -Class 3 MLUR - Sch.3 Notification for water use without a permit (minor - 10 days prior)	September 20/05	October 20/05
Phase I	**3. Mobilization of TBM** & associated equpiment/camp using Iron Ck. winter route **4. Decline development** and underground test mining and bulk sampling (including construction of portal apron, PAG pad, ponds, etc.)	- Class A Land Use Permit - Class 4 MLUR	September 30/05	November 30/05 (mobilization & decline development)
Phase I		-Type B Water Licence		March - May 2006
Phase I	**5. Summer service**/access for TBM on Amoco road	- amended Land Use Permit	May 2006	42 days after submission
Phase II	**6. New road construction** (Iron Ck)	- Class A Land Use Permit	Spring 2006	Summer 2006
Phase II	**7. Mine** Construction and Commercial **Production**	- Type A Water Licence - Quartz Mining Producton Licence	Spring 2006	Summer 2007

Information submitted in this document is intended to provide sufficient basis for the Environmental Assessment and issuance of permits for the project. Further detailed reports are to be submitted prior to decline development. Tintina understands that submitting these subsequent documents will be set out as conditions in the project's permits.

These reports will include:

1. Geotechnical assessment of the proposed site location (including portal, decline alignment rock characterization, and temporary waste rock storage location);
2. Detailed decline development plan including portal location, decline design, and mining method;
3. Acid rock drainage and metals leachate mitigation plan; and
4. Amended fuel spill and emergency response plan (to be finalized once a contractor has been selected).

4.0 SUMMARY OF PROPOSED DEVELOPMENT

4.1 PROJECT SCHEDULE

Mobilization of the mining equipment and associated equipment will commence in January 2006 and will take approximately two months. Mobilizing is scheduled for this specific time to ensure the required snow depth along the access route, and before typical late-winter snow depths become prohibiting.

Portal and decline development will commence in April 2006 and will take approximately six months.

Activity	Time Period
Mobilization of Mining Equipment	January 2006 – February 2006
Development of Portal and Decline	Commencing February 2006
Access Road Upgrade	June 2006 – July 2006
Demobilization of Mining Equipment	October 2006 – November 2006

4.2 SUMMARY OF PROJECT WATER USE AND WASTEWATER MANAGEMENT

To facilitate environmental assessment review, details regarding the various uses of water and subsequent management of wastewater are summarized below by project component. Some of these specifics are also addressed individually throughout the project description in pertinent sections.

4.2.1 Underground Mining

Water use and wastewater management for the underground development is ultimately dependent upon the mining methods employed. The two methods currently being considered (tunnel boring machine or conventional drilling and blasting) have different water use requirements; however, the methods for managing wastewater from the decline development operations are similar.

The approximate water consumption requirements for the tunnel boring machine will be as follows:

- Cooling of the cutting heads and hydraulic system requires 0.34 m^3/min. This is not a consistent draw from a water source, as it will be re-circulated with a heat exchange unit from a 2,000 L storage tank.
- 0.00093 m^3/sec (81.76 m^3/day) will be required for dust control at the cutterhead.
- It is expected that this water would be hauled or pumped from the Boswell River, with mesh screening covering pump intakes to exclude fish.

Expected water consumption requirements for conventional drill-blast-muck mining methods include:

- Approximately 0.00063 m^3/sec (54.5 m^3/day) for diamond drilling.
- It is also expected that this water would be hauled or pumped from the Boswell River, with mesh screening covering pump intakes to exclude fish.

Water employed in either mining method will be re-used where possible. This will be most possible at greater decline depths, where there is the potential for the development of settling areas in cross drifts, and subsequent re-use of water for dust control/drilling.

In the absence of this re-use potential, this minimal volume of water will either be collected with the muck and transported to surface or will be pumped to the adit water treatment/evaporation pond. In the event that the adit intersects groundwater and must be de-watered to continue mining activities, the adit water treatment pond will be sized and constructed accordingly to evaporate the adit water production. Please see Table 3, "*Estimated Potential Underground Dewatering Rates*", for the estimated maximum rate of dewatering, should groundwater be encountered at any time during the underground development program. The final design and operation of the treatment system for this water will be contingent upon daily geochemical sampling and flow monitoring of the water entering the pond. Please see Figure 4 for the proposed portal and supporting development plan.

There is no direct discharge of water planned from this treatment pond. Final engineering design of the pond will target complete containment and evaporation. In the unlikely event of the necessity of release of volumes of water from this pond, the daily geochemical sampling program will be expanded and intensified to characterize the pond discharge quality and quantity. There will under no circumstances be a direct discharge of effluent to surface water. Any pond discharge will be applied to surface for land treatment, and will be fully compliant with Metal Mining Effluent Regulation standards (MMER).

Waste rock that is found to be potentially acid generating (PAG) through laboratory testing will be contained on the proposed PAG rock storage pad. An adjacent evaporation pond will be designed to collect and contain the full volume of meteoric water run-off from this rock. Similar to the adit water treatment pond, this containment system is not expected to require discharge to the receiving environment. Contingency measures similar to those proposed for the adit water treatment pond will be employed for the leachate evaporation pond if release is required due to extraordinary precipitation levels. Pumping of a portion of this water to the adit water treatment system may be conducted, in which case the treatment would be adjusted accordingly to meet MMER standards.

Table 3 Estimated Potential Underground Dewatering Rates

GPM	L/M	m^3/min	m^3/hr	HEAD (m)	WATTS	m^3/day (24 hr)
20	90.8	0.091	5.4	200	4204	130.8
30	136.2	0.136	8.2	200	6384	196.1
50	227.0	0.227	13.6	200	10589	326.9
75	340.5	0.341	20.4	200	15883	490.3
100	454.0	0.454	27.2	200	21177	653.8
150	681.0	0.681	40.9	200	31884	980.6
200	908.0	0.908	54.5	200	42432	1307.5
300	1362.0	1.362	81.7	200	63609	1961.3

To summarize:

- Direct water use is expected to be minimal, regardless of the mining method employed;
- There is no direct discharge of wastewater planned for the project; and

- Further details and design specifics regarding collection, storage and treatment systems will be provided in the Acid Rock Drainage and Metals Leachate Mitigation Plan.

4.2.2 Camp Facilities

The proposed 40-person camp for the decline development activities will be require approximately 8,500 L (8.5 m^3) of water per day. Drinking water will likely be drawn from the Boswell River and hauled to the camp by water truck on a daily basis. Water will be treated for bacteria, giardia and cryptosporidia cysts, and treatment specifics will be provided to Government of Yukon, Environmental Health Department (Yukon Environmental Health), for approval before the establishment of the camp.

Camp sewage will be treated and discharged to surface using a package treatment plant on skids.

All storage tank specifications, treatment systems and total system design will be developed in consultation with and approved by Yukon Environmental Health, including adherence to pertinent storage tank regulations.

4.3 PROPERTY ACCESS

Amoco Route:
An existing winter trail to the site, once used by Amoco to support drilling at the site in the late 1970's and early 1980's (please see Figure 3), will be used to mobilize equipment to the site for the fall geotechnical program (please see Section 4.4.4). This trail may also be used as required during 2006 to transport support equipment for the underground exploration program. If the Amoco trail is required for this reason, the route will not be modified or upgraded and low impact vehicles (such as Challenger rubber tracked vehicles) will be utilized.

Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Legend

- Water Quality Sample Sites
- Waterfalls
- Road
- Secondary Road
- Trail
- Proposed Winter Access
- Contour
- Water Course
- Water Body
- Airstrip
- NTS Boundary and Number

Projection: UTM Zone 8 NAD83
Units: Meters
NTS Sheets: 105C/13, 105C/14, 105F/03, 105F/04

Winter Access Route

Figure 3

Scale: 1:130,000

0 1 2 4 6 km

ACCESS CONSULTING GROUP

Drawn by: HD | Checked by: RM

Date: September 2005

Our File: D:\Project\AllProjects\TML-05-01\gis\mxd\Report2005\Fig3_WinterAccess.mxd

Iron Creek Route:

The Iron Creek route (please see Figure 3) will be used for the mobilization of underground mining equipment, fuel and support equipment for the underground exploration program, camp facilities, heavy equipment for surface operations and consumables required for underground decline development program as per the project schedule shown on Table 2. Please see Table 4 for a detailed listing of the above equipment and Figure 3 for the location of the Amoco 1970's trail modified by the more direct Iron Creek route.

Tintina has chosen the Iron Creek route as the preferred route for mobilizing and demobilizing the equipment required to complete the underground exploration program and, if feasible, for future mining production at Red Mountain. The Iron Creek route improves upon the Amoco trail by significantly reducing the environmental concerns with the longer Amoco trail. Rationale for using the Iron Creek route includes the following:

- the route is 18 km shorter than the Amoco 1970's trail which will improve efficiency for concentrate haulage and lessen environmental effects;
- it is a more secure route for carriers (improved grades) and emergency access;
- there are no fishery impacts (according to fisheries baseline information collected during 2005 field studies);
- there will be only six stream crossings versus eleven along the Amoco trail, and no bridges will be required;
- the route is partially existing along Iron Creek; and
- the route is located mostly within a broad upland open valley and requires less timber to be cut than the Amoco 1970's trail.

Tintina plans to use this route during mobilization of the mining equipment and camp supplies in the winter of 2005/06. Apart from providing shorter access to the mine site, Tintina will use the opportunity to conduct an important reconnaissance of the route during winter conditions. Information will be gathered for:

- permafrost;
- glaciated streams;

- snow depths; and
- avalanche and other terrain hazards.

This data will be used to make decisions about permanent routing and to support the engineering design of an all season road that will be the subject of permitting applications and supporting documentation to be submitted in summer 2006. Government of Yukon, Energy, Mines & Resources staff have viewed the Iron Creek route by helicopter and have stated that it is preferable to the Amoco 1970's trail due to the shorter length, presence of wide open upland valleys, and reduced potential environmental impact (B. Dunn, pers. comm.).

4.3.1 Winter Mobilization

During the decline development, mine equipment will consume approximately 930,000 L of diesel fuel. The diesel fuel will be transported to the site during winter via the Iron Creek route in regular highway-type tanker trucks. These units are expected to have a capacity of 27,000 L (35 loads). A total of 10 tanks will brought to the site with one tank per truck.

The mining equipment will be mobilized to the site utilizing the Iron Creek route. Heavy equipment brought to the site will be used initially to construct the winter road and then for road construction, pad development, waste transport, waste pad construction, camp location preparation, constructing drill pads, and other miscellaneous tasks. The list of equipment that will be required consists of two crawler tractors, one D8 size and one D7 size, a rubber tired loader to load waste and tailings, two 6-wheel-drive rock trucks, one excavator to trench for the waterlines and to help install the camp facilities, and several small miscellaneous vehicles including mechanics, service and foreman's vehicles, and a hiab truck. This is a total of nine loads of surface equipment that will be mobilized to the site over the winter road.

Table 4 Load Details for Equipment and Material Mobilization Using Winter Access Road

Equipment	Specification	# Loads
TBM	250 tons	20
TBM Support	Parts, tools	10
TBM Track		13
Crane	50 ton	2
Generator (TBM)	2 MW	1
Generator (Camp, shop, etc.)	125 kW	1
Underground ore truck	4 of them	4
Rock Truck	25 ton	2
Dozer	D7	1
Dozer	D8	1
Loader	966 F	1
Excavator	EX 200	1
Fuel	930 000 L	34
Camp	24 man	8
Fuel Tanks	95000 L x 10	10
Misc. Vehicles	Pickup, Hiab, etc	4
Total		**113**

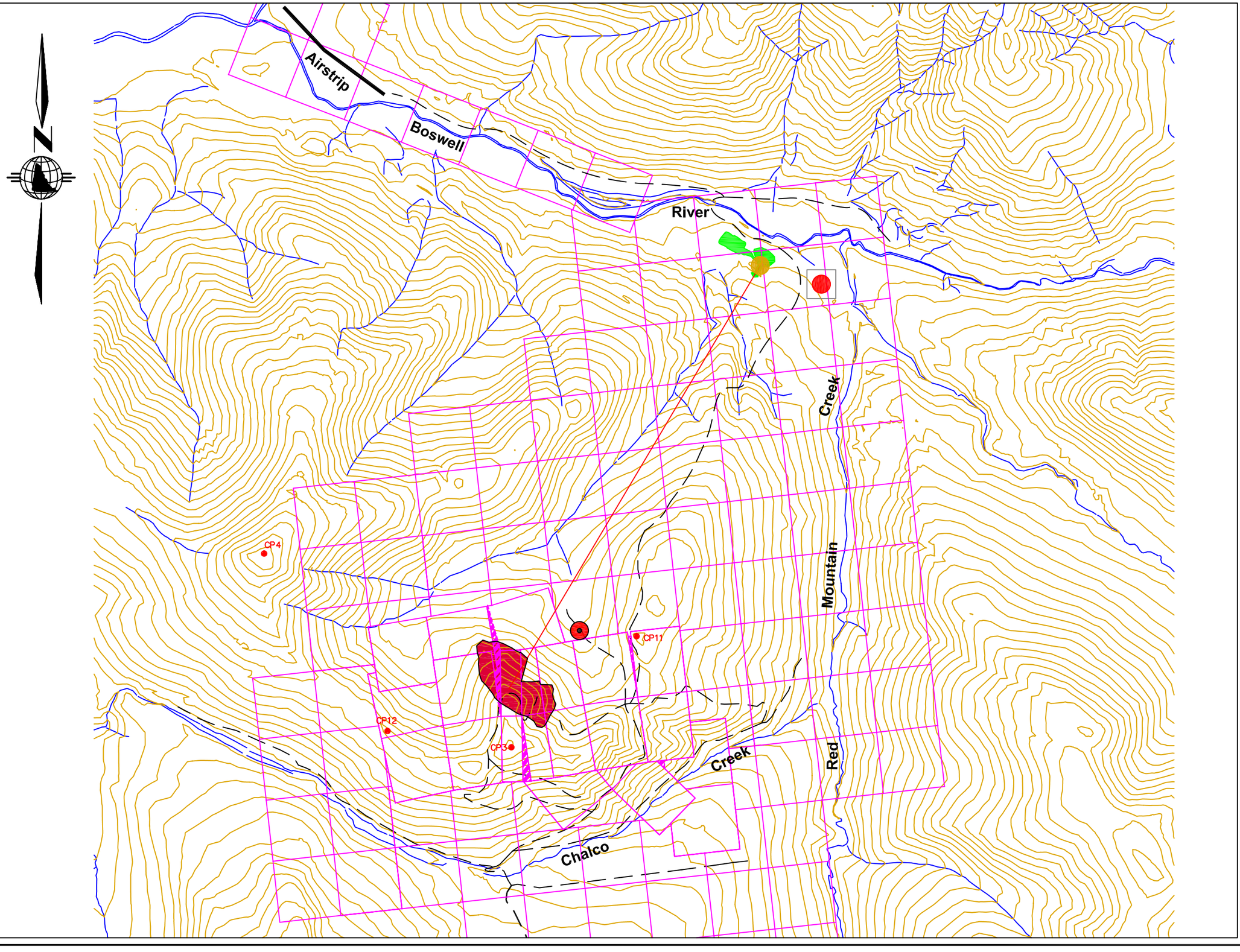
4.4 UNDERGROUND DEVELOPMENT PROGRAM

The primary goal of the 2006 Advanced Development Project is to complete the development of an underground decline to access the Red Mountain porphyry molybdenum ore deposit. This decline will support further underground development, including the acquisition of a bulk sample for further metallurgical testing. The exploration access decline will provide access for underground workings (drifting and cross cutting to different levels within the mine), and underground drilling program to further delineate reserves (see Figure 4).

Red Mountain Project

Yukon Territory

Tintina Mines Ltd.



Legend

- Road / Trail
- Contour
- Water Course
- Proposed Portal Location
- Proposed Decline Location
- Approximate Ore Body Location
- Proposed Camp Location
- Tintina Mines Mining Claim
- Existing Camp Location
- Proposed Portal Area

Proposed Portal Location

Figure 4

Scale: 1:25 000

0 250 500 1000 m

Yukon Engineering Services

ACCESS CONSULTING GROUP

Drawn by: GCC Checked by: RH

Date: September 2005

File: S:\Jobs\E05-040\Figure3.dwg/Figure3

The recommendation for underground exploration was first made by Amoco geologists and consultants in the late 1980's, best expressed by the following statement in the 1992 Summary Report by S.F. Sabag:

> *"Following completion of the 1982 work, it was apparent that additional exploration from surface would not materially contribute to gaining any better an understanding of the deposit than that already established from the information on hand. It was decided that any future work would be best carried out from underground, and accordingly a preliminary development work program was outlined to provide a planning framework."*

Current Tintina management have accepted this recommendation, and the 2006 Advanced Exploration Program has been planned accordingly.

At this point, one of the promising options being considered is the use of a TBM to drive the decline; however, the final decline geometry and results of the planned fall 2005 geotechnical evaluation program will dictate the mining method (use of TBM versus conventional drilling and blasting, or a combination of both methods). Once the determination of mining methods has been made, Tintina will prepare and submit a separate report that provides details of the program.

4.4.1 Technical Data for Proposed Mining Methods

4.4.1.1 Tunnel Boring Machine (TBM)

A TBM may be used to develop the decline at the Red Mountain Property. TBM's have been increasingly applied in mining-related excavation projects recently thanks to technological advances in cutter design, electronic control and hydraulic systems development (Cigla et al, 2001).

Generically, TBM's consist of a rotary cutting head/face, a track system to advance the unit and a conveyor system to remove the muck to surface. As the unit advances, the

TBM also casts a concrete stabilizing wall along the tunnel. These boring machines have documented advantages over conventional drill and blast methods. These include[3]:

- greatly improved personnel safety due to the elimination of blasting procedures and associated toxic fumes;
- reduced ground disturbance resulting in lower support requirements for provision of a safe, stable opening;
- uniform waste rock generation, allowing for easy and continuous haulage;
- reduced ventilation requirements due to the smooth walls created by a TBM; and
- machine excavation is highly suitable for automation and remote control.

The boring diameter of the unit will be approximately 5 m and the complete TBM will weigh approximately 225 tonnes. The TBM and support equipment (ventilation, water pumps) will required approximately 4,000 kW to be supplied by a diesel generator. The fuel requirement would be approximately 109 L/hr. TBM's do not require the use of any hazardous materials beyond the diesel fuel for power generation. The machine runs on standard mineral oils for the hydraulic and lubrication systems.

The expected rate of advance through granite/schists is approximately 30 m/day. Muck consistency would be expected to be 1" x ½ " rock chips (75%) and sand-sized fines (25%).

Crew requirements for TBM operation include a total of 14-18 persons per shift:

- One (1) Superintendent;
- One (1) Operator;
- One (1) Master Mechanic;
- One (1) Electrician;
- One (1) Crane Operator;
- Two (2) Muck Car Drivers;
- Two (2) Ground Support; and
- Seven (7) General Labourers.

[3] Cigla, et al, 2001

https://www.nwp.usace.army.mil/op/srs/myimages/large/7mole1.jpg

Plate 4 Typical Tunnel Boring Machine

4.4.1.2 Conventional Drilling & Blasting Underground Tunnel Development

Tintina may employ an underground mining contractor to develop the Red Mountain decline, depending on rock conditions (e.g. hardness, fractures, density, etc.) discovered during the fall Geotechnical program, and economic and other logistical considerations.

The Canadian mining industry has developed a number of World expert underground mining contractors over the past century, and if conventional drilling & blasting (as opposed to a Tunnel Boring Machine) is decided upon, Tintina may decide to use one of these contractors. As stated previously in this report, once this determination has been made, Tintina will prepare and submit the Detailed Decline Development Plan, which will provide mining method chosen, specific technical details of that method including environmental mitigation and the final design of the decline.

In order to secure a Mining Land Use Authorization that allows either method to be selected, the following typical specifications in Table 5 are supplied for the purposes of environmental assessment:

Table 5 Typical Specifications for Conventional Drilling and Blasting of a 5m x 5m Decline

Crew Size:	4 man crew @ 2 shifts
Water usage	11,356 litres/day
Explosives:	- Type 80% ANFO, 20% forcite (stick powder) will increase stick powder proportion if very wet - per 3.7 m round (12 ft round): 8 bag ANFO, 1 case stick powder - If a very sensitive area will use a non-ammonium emulsion
Rate of Advance	7.6 m/day (25 ft/day)
Other hazardous materials	Normally no additional hazardous materials (other than fuel and dynamite), will normally build a double settling pond system with absorbents to remove any films and with regular sludge removal
Fuel Usage	3,028 - 3,785 litres/day
Muck Removal	5.5 m or 7.3 m scoop tram with 26 or 35 ton truck
Muck grain size (approx):	- cobble 50% - gravel 20% - sand 25% - silt 5%

Explosive materials that could be stored on site prior to consumption include: detonators, primacord, boosters, and connectors. These will be stored in prefabricated magazines that will be selected and located in compliance with local and federal regulations. Non-classified ammonia nitrate (AN) prills will be stored in a silo facility provided by the explosive supplier. The explosives supplier is responsible for obtaining any necessary authorizations.

4.4.2 Waste Rock Management

Initial laboratory results for static ABA/metals leachate, conducted on core and outcrop samples (metals content, metals leachate, acid base accounting [modified Sobek Method], leaching/neutralization potential) are attached to this report as Appendix I.

The waste rock storage area has been planned for the entire volume of waste rock that is potentially acid generating (see Figure 5). A detailed ARD/ML Waste Rock Storage and Mitigation Plan will be submitted following the geotechnical program to be completed in the fall. At that time, more information will be known about potential acid-generating (PAG) and metals leaching potential of the waste rock. This report will include:

- detailed information on waste rock storage location and dimensions;
- estimated volume and tonnage of waste rock;
- laboratory results for metals content, metals leachate, kinetic tests for weathering characteristics, and acid basic accounting from fall geotechnical program;
- characterization of waste rock storage area including soil permeability and permafrost;
- procedures for transportation of waste rock from underground to the storage area and plans for the segregation of PAG and non acid-generating (NAG); and
- water collection.

Mitigative measures have been proposed with this application to ensure that should ARD/ML issues be confirmed (principally through the fall geotechnical program, but also from actual decline development), suitable action could be taken. The measures involve the placement of PAG rock to be placed in lined enclosures, with a leak collection system and hydraulically connected evaporation pond to deal with meteoric water. NAG will be used for the construction of the portal apron and NAG temporary storage pad (please refer to Section 4.2 and Figure 5).

Table 6 shows estimated PAG storage pad calculations. More detailed numbers will be available following the geotechnical program to be conducted in the fall of 2005.

PRELIMINARY
EXPLORATION PORTAL
POTENTIAL-ACID-GENERATING
TEMPORARY ROCK
STORAGE PAD AND BERM

Boswell River

SAM 19

SAM 40

SAM 38

SAM 17

Gravity Fed Overflow Pipe

PRELIMINARY EVAPORATION POND

50m

79m

PRELIMINARY P.A.G. ROCK STORAGE PAD

65m

65m

POTENTIAL ADIT WATER TREATMENT POND AND BERMS

BACKUP RAMP @ -11%

3.0m

5.5m

POSSIBLE WATER TREATMENT SITE

APPROXIMATE PORTAL LOCATION

ASSUMED COMPETENT ROCK INTACT LOCATION

PRELIMINARY
EXPLORATION PORTAL
APRON AND
NON-ACID-GENERATING
TEMPORARY ROCK
STORAGE PAD

110m

Existing Trail

930 940 950 960 970

Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Legend

- NOT FOR CONSTRUCTION -

Underground Development Waste Management Plan

Figure 5

Scale: 1:2000

0 20 40 80 m

Yukon Engineering Services

ACCESS CONSULTING GROUP

Drawn by: GCC Checked by: RH

Date: September 2005

File: S:\Jobs\E05-040\Figure3.dwg/Figure4

Table 6 Potential Acid Generating (PAG) Storage Pad Sizing Input Calculations including Pad Dimensions

	%	M	M	M^2	M^3
Length, Diameter, End Area, volume of Decline		3400	5	19.6	66759
Total In-Situ Decline Rock Volume					66759
In-Situ Portal and "Other" Rock Volume (Est.)					10000
Estimated Total In-Situ Rock Volume					76759
Estimated Expansion Factor	10%				7676
Total Rock Storage Requirements					84435
Preliminary Estimate of **PAG** Rock	30%				**25330**
Preliminary Estimate of **NAG** Rock	70%				**59104**
Preliminary **PAG** Storage Capacity					**25330**
Height of **PAG** Stockpile on Pad		6			
Floor Dimensions		65.0	65.0	4222	
Dimensions 4 m up from floor (2H:1V Slopes) for Berm Crest, includes 1m Freeboard		81.0	81.0	6557	
Dimensions 3 m up from floor (2H:1V SLOPES)		77.0	77.0	5925	
Top Dimensions of **PAG** Stockpile		65.0	65.0	4222	
Actual **PAG** Storage Capacity					**30440**
Contingency (Not including Freeboard)					**5110**

Table 6 should be reviewed in conjunction with Figure 5, "*Underground Development Waste Management Plan*".

4.4.3 Bulk Sampling Program

Approximately 10,000 tonnes of ore grade (>0.3 % MoS_2) will be collected for shipment to an ore processing and testing facility. There will be no processing of ore on the Red Mountain property and no ore grade material from the bulk sampling will be left onsite.

Bulk samples will be temporarily stored on the PAG rock storage pad while being prepared for shipment.

4.4.4 Geotechnical Program

Tintina will first conduct an independent geological assessment of fault systems, prior to undertaking the geotechnical program to confirm the suitability of the proposed decline location. The geotechnical program will further determine the suitability of the proposed portal location and decline geometry, with respect to engineering stability, rock density and other geotechnical parameters that would affect the ability to advance the decline in a cost effective and safe fashion.

The program will also include the evaluation of unconsolidated (surficial) material and permafrost conditions in areas proposed for waste rock, camp, lay down and staging areas, and other support site locations.

The geotechnical program has been designed to accomplish the following specific objectives:

- Determine suitability of the proposed portal location and decline geometry;
- Guide the decision as to proposed mining methods (i.e. TBM or conventional drilling and blasting or a combination thereof);
- Evaluate unconsolidated (surficial) material and permafrost conditions in areas proposed for waste rock, camp or other support site locations;
- Evaluate the materials underlying proposed temporary waste rock storage pad;
- Evaluate the nature of the soil and rock materials underlying the proposed apron for the decline portal area;
- Conduct material testing of samples from rock and soil drilling programs, including grain size analysis, moisture level detection, compaction and strength tests, permeability tests, etc.;
- Undertake a bedrock drilling program to evaluate geological structure along the proposed decline alignment (e.g. rock density, abrasivity, abundance location, and characterization of any faults, fractures, etc. in the lithology, etc.); and
- Conduct terrain mapping (surficial geology and geomorphology) and terrain stability assessment in the mining development areas.

The results of the fall Geotechnical Program will be submitted as a separate report prior to the commencement of the project.

4.5 CAMP FACILITIES

4.5.1 Temporary Camp

A temporary camp to be used during the underground development will be established near the decline portal location (see Figure 5). The camp will house a crew of approximately 40 persons. The camp will include 7 bunkhouse units, 1 wash car, 1 dry unit, 2 kitchen units, an incinerator and a generator building. The camp will be mobilized to the site in the winter of 2006 in modular units. Electrical, fire suppression, propane and plumbing systems for the camp will be permitted and installed by registered Yukon contractors, and a camp inspection will be coordinated with Government of Yukon, Building Safety, prior to occupation. For camp water use, please refer to Section 4.2, "*Summary of Project Water Use and Wastewater Management".*

4.5.2 Fuel

Fuel will be transported to the site during mobilization in January 2006 and will be stored at the existing staging area. Appropriate containment (both primary and secondary) measures will be employed at the fuel storage area. Secondary containment will likely be provided by manufactured and commercially available berm structures and will provide containment of a minimum of 110% of the maximum stored fuel volume.

4.5.3 Fuel Spill Contingency and Emergency Response Plan

A preliminary Fuel Spill Contingency and Emergency Response Plan is attached to this report as Appendix II. The plan will outline procedures to be followed in the event of a petroleum product spill during all phases of the project. Safety procedures for personnel and proper equipment usage during such operations are discussed within this plan.

A detailed *Fuel Spill Contingency and Emergency Response Plan* will be submitted prior to the mobilization of the TBM and once contractors have been finalized.

5.0 CHARACTERIZATION OF THE ENVIRONMENT

It is proposed that the approximate spatial boundaries for assessment be based on the potential geographic extent of effect. The spatial boundaries proposed for the assessment of biological and physical environment, traditional use, and archaeological and heritage resources are defined in Figure 6 and is intended to encompass all of the project infrastructure including the Red Mountain watershed. Fisheries, wildlife, and archaeological data was also collected for the 1970's Amoco trail.

The temporal boundaries of the assessment are proposed to include the mobilization of the mining equipment, development of the decline, and demobilization.

5.1 TERRESTRIAL ENVIRONMENT

5.1.1 Geology and Mineralization

The reader who wishes to develop a detailed geological understanding of the Red Mountain Deposit is directed to "*Geology and Mineralization of the Red Mountain Porphyry Molybdenum Deposit, South-central Yukon"*, by P. Brown and B. Kahlert, Amoco Canada Petroleum Co. Ltd., 1986, or to "*Red Mountain Molybdenum Deposit"* by Tintina Mines Ltd., S.F. Sabag, 1992.

The following passages, excerpted from Brown and Kahlert (1986), provide an overview of:

- general geologic setting;
- property geology; and
- alteration.

And from Sabag, 1992:

- mineralization of ore reserves.

Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Legend

- Road
- Secondary Road
- Trail
- Proposed Winter Access
- Contour
- Water Course
- Water Body
- Airstrip
- 105C/13 — NTS Boundary and Number
- Study Area
- Tintina Mines Mining Claim

Projection: UTM Zone 8 NAD83
Units: Meters
NTS Sheets: 105C/13, 105C/14, 105D/16, 105E/01, 105F/03, 105F/04

Environmental Study Area

Figure 6

Scale: 1:200,000

0 2.5 5 10 km

ACCESS CONSULTING GROUP

Drawn by: HD/PI | Checked by: RM

Date: September 2005

Our File: D:\Project\AllProjects\TML-05-01\gis\mxd\Report2005\Fig6_StudyArea.mxd

5.1.1.1 General Geologic Setting

"The Red Mountain porphyry molybdenum deposit is situated in the Big Salmon Range, approximately 80 km east-northeast of Whitehorse, Yukon.

Red Mountain is underlain by Paleozoic, argillaceous sedimentary rocks of the Yukon Cataclastic Complex, which have been intruded by a multi-phase mid-Cretaceous stock.

Mineralization, quartz stockwork, metal zonation, and an alteration assemblage characteristic of porphyry molybdenum systems have been superimposed on quartz monzonite porphyry and adjacent hornfelsed sedimentary rocks. A later, barren and pyritic quartz-eye diorite porphyry body and related dykes have dissected the quartz monzonite porphyry, hornfelsed sedimentary rocks and associated molybdenite mineralization.

Drill-indicated geological reserves[4] of molybdenum mineralization outlined to date consist of 187,270,000 tonnes grading 0.167% MoS_2."

Property Geology

Pre-Porphyry Rocks

"Templeman Kluit (1977) noted K-AR age dates of 83.2 to 68.3 Ma. The mineralizing event within the Red Mountain stock produced a K-Ar age date of 95.6 ± 2.8 Ma (Stevens et al, 1982). This age, while older than that for the Quiet Lake Batholith, correlates with other age dates in the region such as those given by the Cassiar, Seagull and Glenlyon Batholiths."

"The Red Mountain property is underlain by northwest-trending argillaceous sedimentary rocks associated with the Yukon Cataclastic Complex. These rocks are mainly fine-grained, dark grey to black graphitic shale and light grey schist; lesser chlorite schist, quartzite and marble are exposed in the northeast part of the property. The rocks exhibit a moderate level of deformation and are characterized by the presence of cleavage, folds and boudinage features."

Porphyry Rocks

"A series of intermediate to felsic, commonly porphyritic, volcanic and subvolcanic rocks occur northwesterly from Red Mountain to the confluence of the Big Salmon and Yukon Rivers. These rocks are aplite and rhyolite porphyry dykes on the Red Mountain property, and they exhibit clear cross-cutting intrusive relationships within the Red Mountain stock. The Red Mountain region reflects a northwest structural trend, compatible with the Teslin Suture Zone. Transported and cataclastic rocks in the

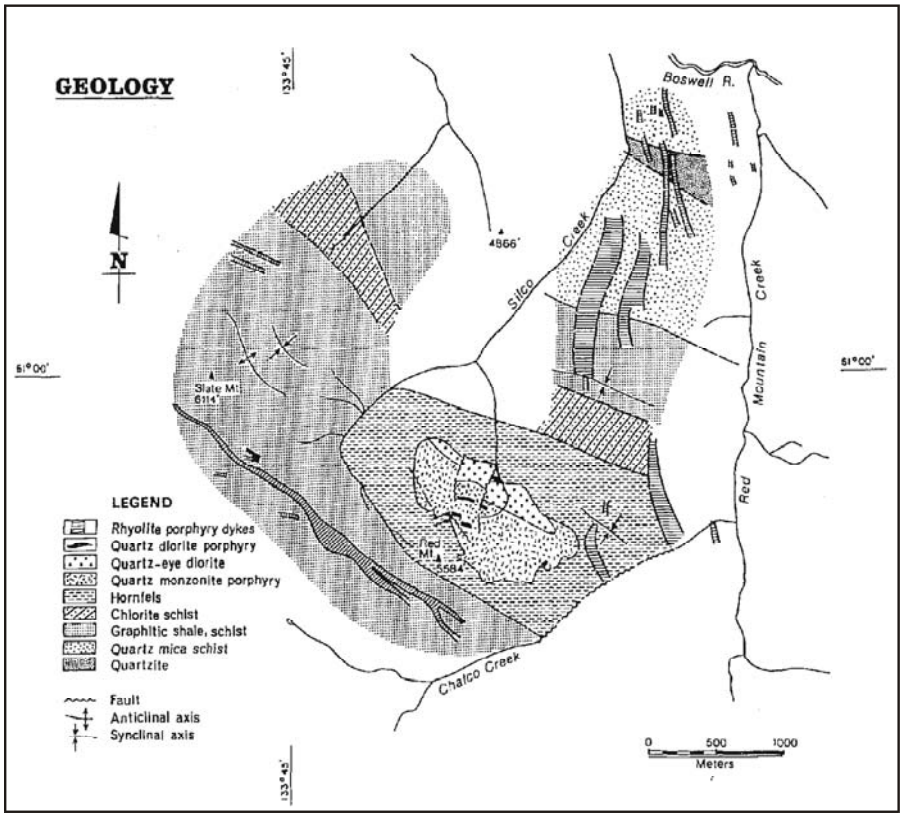
[4] *The term "reserves" is used by Brown and Kahlert prior to the implementation of National Instrument 43-101, under which criteria the tonnage referred to here would be properly characterized as "resources".*

suture zone are dominantly of greenschist facies metamorphism although occurrences of amphibolite facies metamorphism are present. This metamorphism is related to an arc-continent collision that occurred during late Triassic - early Jurassic time (Templeman Kluit, 1979)."

"Intrusive to the argillaceous sedimentary rocks is a northwest trending oval complex of quartz monzonite porphyry, quartzeye diorite porphyry and granodiorite porphyry. Numerous inclusions of partially assimilated sedimentary rocks along the south contact suggest that the quartz monzonite porphyry phase intruded passively. An extensive hornfels aureole developed in the adjacent sedimentary rocks. Hydrothermal alteration in the form of sericitization, silicifiation and chloritization, extended into, and was superimposed upon, the sedimentary rocks. Such alteration effects occur up to 400 m from the contact, grading from unaltered black graphitic shale into a dark grey pyritic and siliceous, chloritic to biotitic hornfels into pale cream, well laminated, sericitic hornfels and ultimately to massive silica-rich hornfels.

The Red Mountain intrusive complex displays a northwest trend compatible with the regional strike. It is oval in shape with dimensions of 1450 m by 650 m and appears to dip steeply north. The complex consists of several major and minor phases. These phases include pre-mineral quartz monzonite porphyry, post-mineral quartz-eye diorite porphyry, quartz diorite porphyry and at depth, granodiorite porphyry."

Figure 7 General Property Geology



Brown and Kahlert, 1986, showing representative geological units selected for Acid Rock Drainage/Metals Leachate testing)

See also Figure 4 for proposed decline location and Amoco geological overlay.

"Hydrothermal activity appears to have produced considerable changes in composition of the quartz monzonite porphyry and consequently its original composition is unknown. Although the post-mineral quartz-eye diorite porphyry and granodiorite porphyry are altered, their major element abundance is probably close to their original compositions.

The quartz monzonite porphyry phase is variably altered and, on surface, accounts for 80% of the complex. The border phase of this porphyry has a fine-grained matrix (0.02 mm to 0.03 mm) which grades fairly sharply downward and inward to a similar porphyry with increasing grain size of matrix (0.15 mm) and with increasing content of phenocyrsts (from 50% to 80%). Phenocrysts in decreasing order of abundance are plagioclase, quartz and biotite. Andesine occurs as subhedral phenocrysts that are commonly zoned with calcic rims. Quartz is typically rounded and partly resorbed with embayments filled with matrix. Medium reddish-brown to light brown pleochroic biotite phenocrysts are the only mafic mineral. Rarely, biotite flakes are included within quartz and plagioclase phenocrysts. The matrix consists of quartz, potash feldspar (within the potassic alteration zone) and rare plagioclase.

A set of inter-mineral dykes of apparently limited extent occur within the quartz monzonite porphyry. These dykes appear to be identical to the propylitically altered quartz monzonite porphyry, however, they tend to be less well fractured, have a weaker quartz stockwork, no hornfels inclusions, weaker molybdenite mineralization, and fine-grained chilled margins. Insufficient information is available to determine the trend of these dykes, but they appear to be steeply dipping.

The main mass of the quartz-eye diorite porphyry intruded along or near the north contact of the quartz monzonite porphyry. On surface, the quartz-eye diorite porphyry comprises 20 per cent of the intrusive complex. It is divided into two units: A-sericitic quartz-eye diorite porphyry, and B-chloritic quartz-eye diorite porphyry.

Unit A is creamy grey, massive and moderately to intensely sericitized. It contains 40 per cent phenocrysts and in order of decreasing abundance, they are: plagioclase, quartz and biotite. Three to five per cent pyrite occurs in a disseminated form throughout this unit. The matrix consists of very fine-grained plagioclase, potassium feldspar and minor quartz.

Unit B is the deeper equivalent of unit A. This unit is massive, slightly more equigranular, weakly to moderately chloritic and commonly displays a fresh appearance. It contains 40 per cent phenocrysts consisting of plagioclase, quartz, and biotite, one to two percent disseminated magnetite, minor pyrite and traces of epidote and laumontite. Quartz-eyes, although just as abundant as in unit A, are not as prominent."

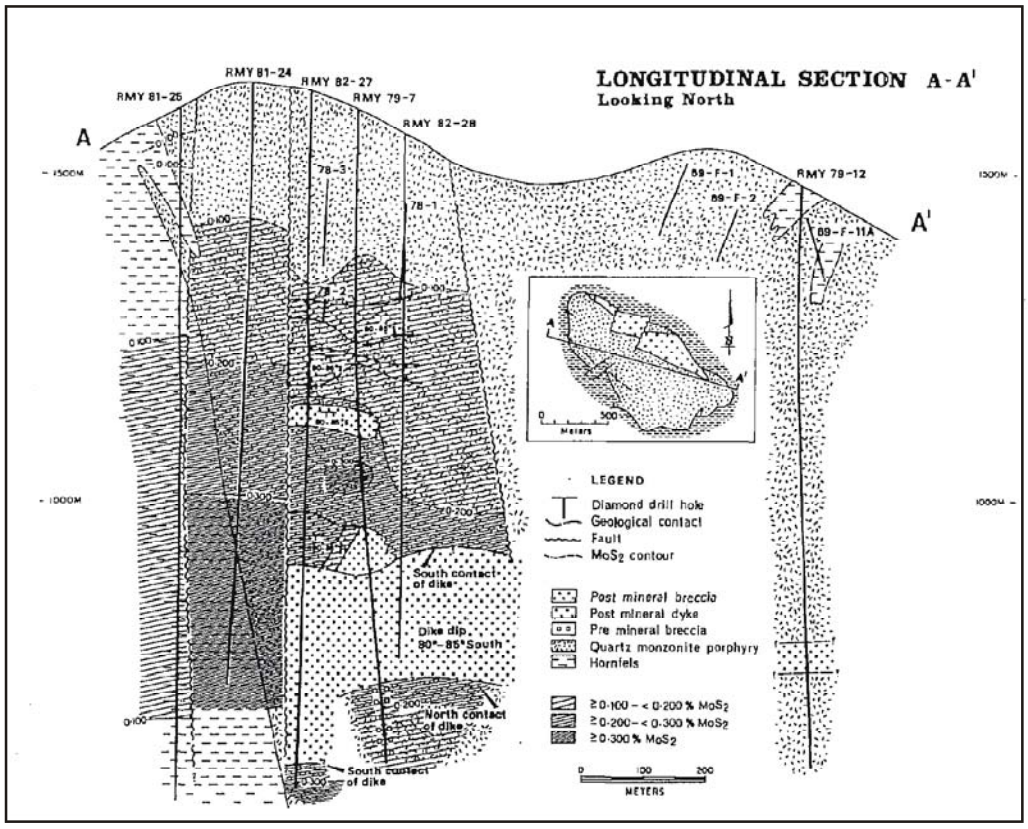
Breccias

"Four distinct breccias have been encountered in diamond drill core. These include pre-mineral, intra-mineral and post-mineral varieties. Lack of data does not permit their size, distribution and orientation to be determined."

"The Pre-mineral Breccia occurs as a brown to bluish grey breccia formed prior to the commencement of the main episodes of hydrothermal activity. A weak barren episode of quartz vein formation prior to brecciation is present. Subsequently, this breccia was cut by a well developed quartz stockwork with moderate molybdenite rnineralization. The distribution of this breccia is uncertain, as it has only been intersected in two diamond drill holes and is not exposed at surface. The breccia varies from brown to bluish grey and consists of variably-altered fragments of quartz monzonite porphyry with lesser hornfels fragments in a matrix predominantly of fine-grained biotite and silica."

"Composition of the contact breccias is variable and appears to be largely dependent upon the intruded country rock. Fragments are subrounded to subangular and consist of quartz monzonite porphyry, hornfels and fragmented quartz-molybdenite veins and are hosted by a quartz-eye diorite porphyry matrix. Molybdenite content of these breccia varies from less than ***0.05%*** *MoS_2 to greater than* ***0.25%*** *MoS_2 . In core length, widths range up to* ***55*** *m, however, their true widths are expected to be considerably less."*

Figure 8 Longitudinal Section Through Ore Body



Brown and Kahlert, 1986, showing representative geological units selected for Acid Rock Drainage/Metals Leachate testing)

5.1.1.2 Alteration

Quartz Monzonite Porphyry

"The Red Mountain molybdenum deposit is intimately associated with well-developed hydrothermal alteration which accompanied or immediately followed emplacement of the quartz monzonite porphyry. The volatiles, principally silica, were involved in vein formation and added 5% to 15% to the volume of the quartz monzonite porphyry and adjacent hornfels.

Propylitic

This alteration is most widespread in the eastern portion of the stock. Here, it is noted on surface and intersected in diamond drill core to a depth of 500 m. Quartz monzonite porphyry within the propylitic alteration zone is green, siliceous, and exhibits partial to complete chloritization of biotite. Within hornfels, epidote is often an additional alteration mineral. Quartz veining and associated molybdenite mineralization is very weak. Prior to faulting, this propylitic alteration appears to have formed a continuous cap overlying the deposit.

Potassic

An extensive zone of potassic alteration, now characterized by an assemblage of potash feldspar, anhydrite, gypsum, retrograde chlorite and secondary biotite has been noted from diamond drilling. Potassic alteration in the form of hydrothermal feldspar and biotite occur as pervasive flooding, as selvages adjacent to both molybdenite-bearing and barren quartz veins and as veins. Pervasive flooding is more prevalent in the outer reaches of the potassic zone. Quartz veins with well-developed feldspar selvages are commonly found in the central portion of the zone.

The potassic alteration zone is not exposed at surface. Its closest approach to surface is west of 5+50W where it is first noted, although over a restricted area, within 250 m of surface (at an elevation of 1400 m). Between 5 +50W and 2+25W, the top of the potassic alteration zone is between 400 m to 450 m below surface (at an elevation of 1100 m to 1150 m) and east of 2+25W, it is below 500 m (at an elevation of 1000 m). The north contact of the potassic zone, where known, is steeply dipping and essentially vertical. Elsewhere, the north contact is cut by a post-mineral phase of the complex. The south and southwest contact of the zone has been faulted by a southeast trending fault.

Phyllic

Development of an extensive phyllic alteration zone, an assemblage consisting of sericite-quartz-pyrite-dolomite, appears to be superimposed on the interface of the propylitic and potassic zones. The intensity and thickness of the phyllic zone is quite variable. Like the propylitic and potassic zones, the phyllic zone is encountered at successively deeper levels progressively eastward as a result of block faulting. East of 2+ 25W, there is only a minor, erratic and relatively insignificant zone of phyllic alteration. West of 2+25W, the intensity and thickness of phyllic alteration increases."

5.1.1.3 Mineralization and Ore Reserves

The following passage is excerpted from Sabag, 1992:

"Molybdenite mineralization at Red Mountain appears to be associated in most part with only with the Quartz Monzonite Porphyry member of the Red Mountain intrusive complex, occurring as mineralization within it and within surrounding hornfels. Mineralization delineated to date occupies the western portion of the Quartz Monzonite Porphyry, although data on hand does not suggest it to be restricted thereto."

"Within the Quartz Monzonite Porphyry, Molybdenite occurs predominantly as fine grained salvages and disseminations within well developed Quartz stockwork veins less than 1 cm in width (typically 1-3mm), in free form or in association with pyrite. Within the hornfels, on the other hand, and especially at depth and nearer the Quartz Monzonite Porphyry, it occurs also as parallel bands within quartz veins, such that throughout the better grading localities a significant portion of the Molybdenite occurs as coating on fractures and as massive seams of up to six millimeters thick.

Minor chalcopyrite, galena and sphalerite have been noted, in addition to a pyritic zone peripheral to the Molybdenite mineralization with local pyrite contents of up to 10 % . Limonitic gossan overlies part of the pyrite zone.

Trace element analyses indicate a subtle inverse correlation between MoS_2, and Cu/Zn/W, and no correlation of Fluorine with MoS_2. Very limited assaying of core for precious metals has returned insignificant results (Ag 2ppm, Au 16ppb). It is of note, however, that despite its relatively low tenor, silver was also recovered in some concentrates during metallurgical testing. In general terms the Molybdenum zone is characterized by the following metal contents:

Cu 0.001 %-0.05% (Avg 0.01 %, Max 0.02%)
Zn 0.003%-0.015% (Avg 0.015%, Max 0.26%)
Pb 0.002%-0.004% (Avg0.003%,Max0.26%)
W 2ppm- 14ppm (Avg 6.8ppm, Max 2,000ppm)
F 400ppm-950ppm (only partial data)

Surface exploration work and diamond drilling on an approximately 125m by 125m spaced drill hole grid, have probed the Quartz Monzonite Porphyry in relative detail down to 1150 m below surface (460m Level). There is a general trend for better grade with depth defining a higher grade core (> 0.2 % MoS_2) laterally away from which quartz-stockwork and associated mineralization gradually diminish in intensity. Vertically upward from this core, molybdenite tenor decreases nearer surface even though the quartz-stockwork is well developed.

Molybdenite mineralization in the 0.05 % -0.10 % MoS_2 range or better has been mapped over a strike length of 1050m, a maximum width of 400m-500m and down to a depth of 1150m below surface (the 460m Level). Within this zone, and approximately 400m-500m below surface (1200m Level), a higher grade core grading > 0.20% MoS_2 has been encountered over some 375 m of strike and down to a depth of 1150m below surface. This higher grade core has been intersected by drill holes over approximately 200m of its width, although its ultimate dimensions have not been fully delineated as it

is truncated to the south by a northwesterly subvertical fault and to the north by the 50m wide dike of barren Quartz-Eye Diorite. This core is also open below a depth of 1150m from surface (460m Level), into as yet unexplored ground.

MoS_2 grades exceeding 0.30% characterize the core below 6OO m below surface (below the 1,OOO m Level), and comparable grade material has been noted to occur to the north of the 50m Quartz Eye Diorite dike which has provisionally been regarded to represent its northern extent. The data gathered to date places no depth limitations on the zone and all indications are that anticipations of outlining additional good grade material would be better than realistic."

"Ore reserve estimates at a cut-off grade of 0.10% MoS_2 define the deposit as being an elongate, steep southwesterly dipping concentration of Molybdenite, approximately 900m long, 150-300m wide and at least 1150m deep, occupying the western portion of the Quartz Monzonite Porphyry. These reserves ***stand*** *at 187,000,000 tonnes grading 0.167% MoS_2."*

"Surface oxidation over the molybdenum zone is relatively deep. It extends down to an average depth of 100m below surface, confined in most part to rusty coating in fractures."

5.1.2 Acid Rock Drainage and Metals Leachate

A review of the geological interpretation of the Red Mountain Property, as presented in Section 5.1.1 above, indicates that the property may have the potential to generate acid rock drainage in the mineralized portion. In order to address environmental issues and guide waste rock material handling requirements for the 2006 Advanced Exploration Program, Tintina has commenced its Acid Rock Drainage/Metals Leachate (ARD/ML) Characterization Program.

5.1.2.1 Previous ARD/ML Work by Public Works and Government Services Canada

As part of a Phase II Environmental Investigation conducted by Public Works and Government Services Canada (PWGSC) under contract to DIAND Technical Services in 1997 (the investigation referred to in Section 2.2 of this report), an assessment of acid rock drainage potential was undertaken by SRK Consultants. The objectives of the PWGSC investigation were to document current site conditions and determine environmental risks posed by the site if it were to remain unoccupied. Therefore, the focus of the acid rock drainage investigation was to determine existing surface conditions, which, since the mine was never in operation, did not include any unoxidized rock moved to surface. The rock sampling conducted by PWGSC was confined to surface samples:

Laboratory results obtained from this sampling indicated that "*In general, metal concentrations are comparatively low in all the rock samples."*

The report concluded that while the surface rock does exhibit advanced oxidation, *"…the remaining potential for acid generation is considered to be comparatively low."*

It was concluded that the site did not pose a significant environmental risk: *"It is unlikely that the infrastructure at the Slate (Red) Mountain site is impacting the local environment significantly."*

5.1.2.2 Tintina's 2005 ARD/ML Program

The objective of the 2005 program undertaken by Tintina was to determine the potential for ARD/ML for the unoxidized rock that will be brought to surface as a result of the 2006 Advanced Exploration Program. Therefore, in addition to surface rock sampling from bedrock outcrops (where no diamond drilling had previously been undertaken), core samples from deeper in the deposit were collected to characterize this material.

The first phase of this work has been to undertake a preliminary geological sampling program to collect representative samples of the various lithologic units, for laboratory ARD/ML testing.

5.1.2.3 Initial Phase ML/ARD Assessment: Geological Sampling

On July 19, 2005, R. McIntyre, J. Taylor and J. McIntyre of Access Consulting Group (ACG) undertook the field sampling component of the program. Samples were collected from core stored on site (to characterize the ore deposit and geological conditions at depth), and from outcrop where no drilling had been conducted. The outcrop samples are reflective of geologic units to be encountered along the path of the decline. Table 7 presents the list of rock units sampled. R. McIntyre and D. Cornett also conducted subsequent sampling on August 24, 2005.

Table 7 Representative Geological Units and Molybdenum Grade Zonation Sample Record

Description	Sample location/origin	ACG Sample #
QED (quartz-eye diorite)	Outcrop grab sample	RM 05 -01
Quartz Mica Schist	Outcrop grab sample	RM 05-02
Chlorite Schist	Outcrop grab sample	RM 05-03
Hornfels	Drill core from DDH RMY 81-25, Interval 297-319 m	RM 05-04
> 0.300 % MoS^2	Drill core from DDH RMY 81-24, Interval 837-855 m	RM 05-05
> 0.100 - < 0.200 % MoS^2	Drill core from DDH RMY 81-24, Interval 381-393 m	RM 05-06
> 0.200 to < 0.300 % MoS^2	Drill core from DDH RMY 81-24, Interval 501-519 m	RM 05-07
QED (quartz eye diorite)	Drill core from DDH RMY 81-25, Interval 198-210 m	RM 05-08
QMP (quartz monzonite porphyry)	Drill core from DDH RMY 81-24, Interval 51-66 m	RM 05-09
Graphitic Shale	Outcrop Grab Sample	RM-05-10

5.1.2.4 Analytical Results

The samples were analyzed by Canadian Environmental and Metallurgical Inc., in Surrey, British Columbia, for static Modified Sobek Method ABA testing, including:

- AP (Acid potential in tonnes $CaCO_3$ equivalent per 1000 tonnes of material);

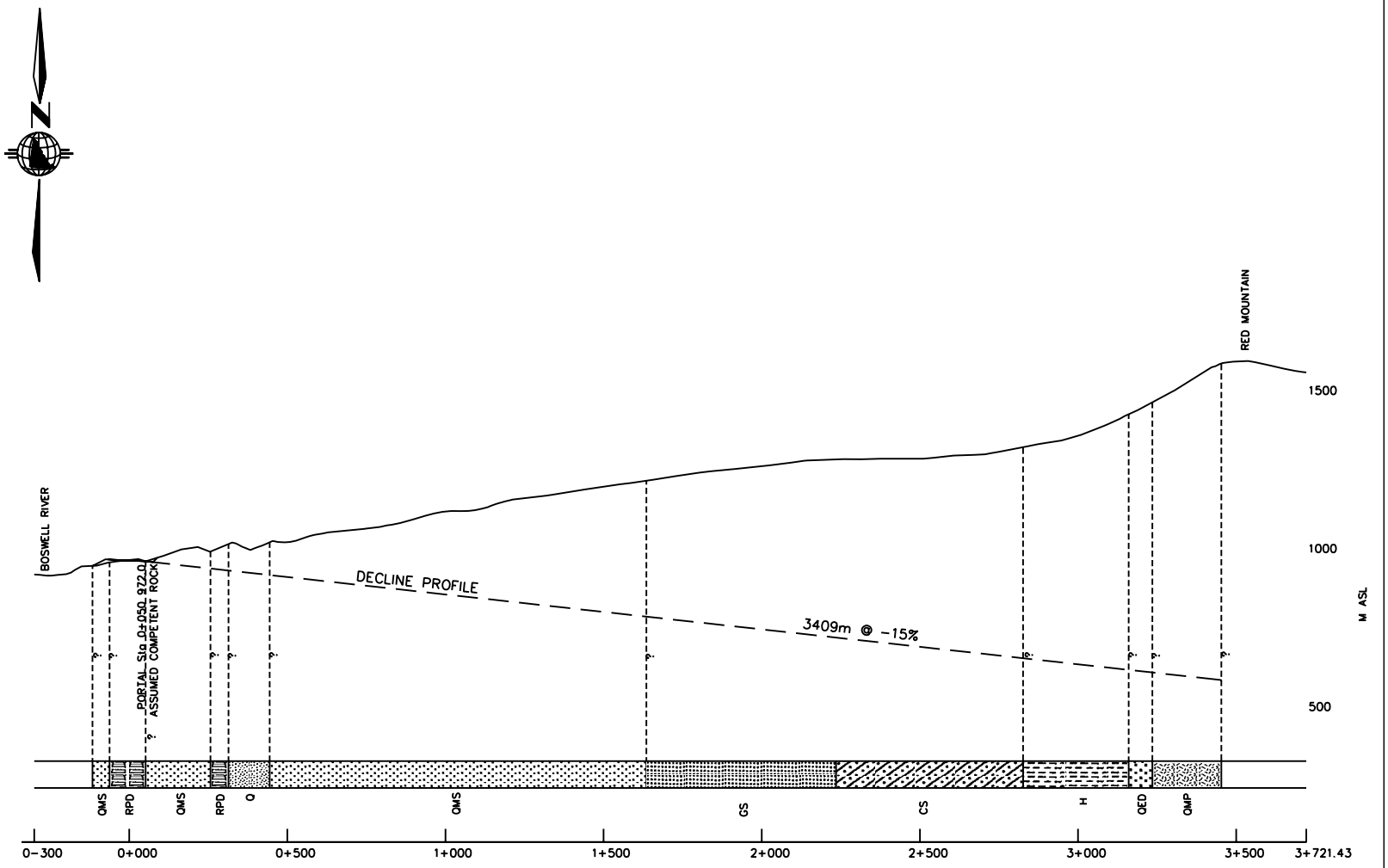
- NP (Neutralization potential in tonnes $CaCO_3$ equivalent per 1000 tonnes of material);
- Sulphur (total), Sulphate Sulphur, Net AP-NP, and fizz test);
- Metals by Aqua Regia digestion followed by ICP;
- 24 Hour Distilled Water Leach Extraction Test at 3:1 Liquid to Solid Ratio (for conductivity, acidity at pH 4.5 and at pH 8.3, and Sulphate); and
- 24 Hour Distilled Water Leach Extraction Test at 3:1 Liquid to Solid Ratio (Leachate analysis by ICP).

The complete analytical results are provided as Appendix I.

5.1.2.5 Preliminary Discussion of Results

Preliminary static test results reveal sufficient justification for treating a portion of the waste rock as potentially acid generating. The lithologic unit that presents the most possibility for problematic chemistry is the Hornfels unit (see Tables 7 and 8), which will not be intersected until approximately 2,700 m in the decline development program. Other lithologic sequences from deeper within the orebody may also present ARD issues (although, it has been noted in Brown and Kahlert, and Sabag, that pyrite content appears to be inversely proportional to molybdenite grade, thereby indicating that with depth, the potential ARD/ML issue will abate). It appears that the greatest concentration of sulphides occurs in the alteration halo that surrounds the deposit.

Figure 9 shows a simplified inferred geology section of the proposed decline.



Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Legend

H	Hornfels
RPD	Rhyolite porphyry dikes
QED	Quartz-eye diorite porphyry
QMS	Quartz mica schist
QMP	Quartz monzonite porphyry
GS	Graphitic shale, schist
CS	Chlorite schist
Q	Quartzite

Note: Geological section inferred from surface mapping by Tintina (S. Sabag, 1992); fault contacts have been assumed to be vertical.

Simplified Inferred Geological Section along Proposed Decline (Looking West)

Figure 9

Scale: 0 125 250 500 m

Yukon Engineering Services

ACCESS CONSULTING GROUP

Drawn by: HD Checked by: DW, P.Geo

Date: October 2005

File: D:\Project\AllProjects\TML-05-01\dwg\Fig9_GeoProf.dwg

Table 8 Analytical Results for Static Modified Sobek Method ABA Testing
(excerpted from Appendix I)

Sample ID	ROCK TYPE	LOCATION	Paste pH	S(T) %	S(SO4) %	S(S-2) %	AP	NP	Net NP	Fizz Test
RM-05-01	QED	O/C	6.1	0.02	<0.01	0.02	0.63	-1.2	-1.8	none
RM-05-02	Quartz Mica Schist	O/C	8.7	0.03	<0.01	0.03	0.94	103.2	102.3	strong
RM-05-03	Chlorite Schist	O/C	8.9	0.06	<0.01	0.06	1.88	8.5	6.6	none
RM-05-04	Hornfels	DDH RMY 81-25: 297-319m	8.8	2.17	0.01	2.16	67.50	29.2	-38.3	none
RM-05-05	>0.300% MoS2	DDH RMY 81-24: 837-855m	8.5	1.51	0.02	1.49	46.56	35	-11.6	strong
RM-05-06	>0.100 - <0.200% MoS2	DDH RMY 81-24: 381-393m	8.5	1.14	0.02	1.12	35.00	48.7	13.7	strong
RM-05-07	>0.200 - <0.300% MoS2	DDH RMY 81-24: 501-519m	8.4	0.98	0.03	0.95	29.69	31.3	1.6	moderate
RM-05-08	QED	DDH RMY 81-25: 198-210m	8.5	2.43	0.03	2.40	75.00	47.1	-27.9	strong
RM-05-09	QMP	DDH RMY 81-25: 51-66m	5.3	1.02	0.69	0.33	10.31	-1.6	-11.9	none
Duplicate										
RM-05-01			6.0	0.02	<0.01	0.02	0.63	-0.9	-1.5	none

Note: this table has been prepared by Canadian Environmental Metallurgical Inc. of Surrey, B.C.

5.1.3 Topography and Soils

The site lies within the Pelly Mountains ecoregion and contains predominately Dystric Brunisols, which are associated with igneous rocks at higher elevations and Eutric Brunisols, which are found in plateau areas with sandy loam morainal parent materials. Turbic Cryosolic soils may occur in alpine areas and on poorly drained areas. Red Mountain is in a region of discontinuous permafrost. Detailed information on soils for the study area is not available. A preliminary site soil survey will be conducted in the fall of 2005.

Red Mountain has an elevation of 1,702 m and consists of relatively steep bluffs. Relief on the property is 700 m, with tree line at an elevation of 1,450 m to 1,500 m (Sabag 1992).

5.1.4 Vegetation and Terrain Hazards

Vegetation

White spruce (*Picea glauca*) is the dominant species in the Pelly Mountain ecoregion. White spruce - feathermoss forests are located on mature sites on most soils and white spruce - lichen forests are located on more rapidly drained soils. Following fire or disturbance, white spruce is found with pine and aspen. In dense forested areas, feathermoss and a shrub layer of Labrador tea (*Ledum groenlandicum*) is common. In less dense forests, kinnikinnick (*Arctostaphylos Uva-ursi*), lingonberry (*Vaccinium Vitis-idaea*), twinflower (*Linnaea borealis*) and lichen understory is common. Black spruce (*Picea mariana*) and willow (*Salix* spp.) may dominate wetter sites (Smith 2004).

Existing information on vegetation for the site is not available. A vegetation survey of the area is planned for fall 2005. The site survey and airphotos will be used to create a vegetation map of the site.

The existing staging area and storage areas are located in open sub-alpine forest. Vegetation in these areas includes spruce species and a low shrub layer. The existing roads on the mountain located at higher elevations are characterized as alpine.

Plate 5 Typical Vegetation on Red Mountain

Plate 6 Looking Northeast from Red Mountain.
(Vegetation Includes Spruce and Low Shrubs.)

Existing forest cover mapping obtained from the Government of Yukon is shown on Figure 10.

Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Legend

- Road
- Secondary Road
- Trail
- Proposed Winter Access
- Contour
- Water Course
- Water Body
- Airstrip
- 105C/13 — NTS Boundary and Number

Forest Cover Type

- Wetland
- Forested
- Alpine
- Non-Productive

Forest Cover Type information provided by Forest Management Branch, EMR, Yukon Government, 2003

Projection: UTM Zone 8 NAD83
Units: Meters
NTS Sheets: 105C/13, 105C/14, 105F/03, 105F/04

Vegetation

Figure 10

Scale: 1:120,000

0 1 2 4 6 km

ACCESS CONSULTING GROUP

Drawn by: HD/PI	Checked by: RM
Date: September 2005	

Our File: D:\Project\AllProjects\TML-05-01\gis\mxd\Report2005\Fig10_Veg.mxd

N

105F/04

105F/03

105C/13

105C/14

Quiet Lake

Slate Mountain

Red Mountain

Slate Creek

Silco Creek

Red Mountain Creek

Chalco Creek

Iron Creek

Proposed Winter Access Route

Big Salmon Range

Swift Lake

Swift River

1970's Exploration Trail

Flat Creek

Twin Creek

Pelly Mountains

Sidney Creek

Mile Hundred Creek

Teslin River

Canol Road

Terrain Hazards

Topography in the Red Mountain area is steep and is susceptible to sliding. There is also potential for permafrost areas within the study area.

A terrain hazard and slope stability assessment will be conducted at the Red Mountain site in conjunction with the geotechnical program in fall 2005. The assessment will also include identifying possible permafrost locations.

There are three historical earthquake epicentre points within 100 km of the project site. These earthquakes occurred between 1983 and 1994 and had a magnitude of between 2.4 and 2.5.

The possibility of forest fires will be considered. Preventative measures to minimize the possibility of worker-caused fires will be implemented.

The potential for flooding at the project site is very low.

There is avalanche potential along the access route and possibly at the portal location. Mitigation for avalanche safety is included in the mitigation section of this report.

5.1.5 Wildlife

Typical wildlife for the Pelly Mountain Ecoregion includes grizzly and black bear, moose, caribou, wolverine, snowshoe hare, Stone and Dall sheep, ptarmigan, and ground squirrel.

The Red Mountain site is within game management zones 824, 825, 826, and 827 and six key wildlife areas (see Figure 11). There are also known sheep winter range polygons approximately 10 km to the west, east, and south of the mine site. Mitigation for the possible effects on wildlife is included in Section 7.0 of this report.

Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Wildlife Key Areas (WKA) are compiled by the Yukon Department of Environment WKA Inventory Program (2005), against 1:250,000 NTDB from various data sources. Key Areas are based on observed locations of wildlife at key times of year, not on habitat assessment. With new information, boundaries and designations of Key Areas can change and additional Key Areas can be identified. Furthermore, Key Areas are not the only sites important for wildlife. Other information sources can identify other sites important for wildlife for reasons outside the scope of the WKA Inventory Program. Updates to Key Areas occur only periodically. For the most current information, please consult with the Regional Biologist for your area of interest. If you have questions or would like to contribute to the WKA database, please contact the WKA Inventory Program (wka@gov.yk.ca).

The Yukon Wildlife Key Area Application. Copyright © 1996-2000, Habitat and Endangered Species Management, Department of Renewable Resources, Government of Yukon.

N

105E/01
105F/04
105F/03
105C/13
105C/14
105D/16
811
825
824
826
827
815
817
OC 19
OC 17

Indian River
Bull Creek
Little Bear Creek
Boswell River
Teslin River
Shelton Creek
Baker Lake
Rosy Lake
Swift Lake
Slate Creek
Silco Creek
Red Mountain Creek
Chalco Creek
Iron Creek
Flat Creek
Twin Creek
Sidney Creek
Mile Hundred Creek
Quiet Lake
Canol Road

Slate Mountain
Red Mountain
Pelly Mountains
Sawtooth Range
Big Salmon Range
Mount McClintock

Proposed Winter Access Route

1970's Exploration Trail

Legend

- Road
- Secondary Road
- Trail
- Proposed Winter Access
- Contour
- Water Course
- Water Body
- Airstrip
- 105C/13 — NTS Boundary and Number
- Trapping Concession Boundary
- 817 — Game Management Area Boundary and Number
- OC 19 — Outfitting Concession and Number
- Study Area

Wildlife Key Areas

- Bald Eagle
- Thinhorn Sheep
- Woodland Caribou
- Waterfowl

Projection: UTM Zone 8 NAD83
Units: Meters
NTS Sheets: 105C/13, 105C/14, 105D/16, 105E/01, 105F/03, 105F/04

Wildlife Key Areas & Game Management Zones

Figure 11

Scale: 1:200,000

0 1 2 4 6 8 10 km

ACCESS CONSULTING GROUP

Drawn by: HD/PI | Checked by: RM

Date: September 2005

Our File: D:\Project\AllProjects\TML-05-01\gis\mxd\Report2005\Fig11_Wild.mxd

A review of the species at risk in Yukon was considered in accordance with the Species at Risk Act (2002) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2004). Species at risk whose ranges could conceivably overlap within the study area include:

- wood bison, peregrine falcon Anatum subspecies (Threatened);
- grizzly bear, wolverine, short-eared owl (Special Concern); and
- mule deer, elk, cougar (at risk in Yukon but not elsewhere).

Interviews were conducted by Grant Lortie (Wildlife Specialist) with local trappers and an outfitter who uses the study area for hunting and fishing to document their local knowledge of the study area. This information is summarized in Appendix III.

5.2 AQUATIC ENVIRONMENT

A summary report of the Phase I baseline biophysical studies for 2002-2005 is attached to this report in Appendix III.

5.2.1 Hydrology

Stream flows in the Yukon are generally characterized by peak flows in the spring and low flows in the winter. Maximum discharges typically occur during the spring as the result of snow melt or rain-on-snow events, with flows gradually decreasing following the disappearance of snow. Sizeable flood events may also occur in the late summer due to intense rainstorms. These rainfall events are particularly significant on small basins. The smallest discharges of the year occur in mid-winter. Ice develops on all rivers and many streams freeze entirely, reducing their winter flows to zero.

Streams in the environmental study area include Boswell River, Chalco Creek, Red Mountain Creek, Slate Creek, Silco Creek, Sidney Creek and Iron Creek.

ACG has established a hydrometric station on the Boswell River below the confluence of all tributaries draining into the Red Mountain property (summer 2005). Data from this

station and subsequent stations on the property will be used to characterize flow discharges and water balances for the site.

Standardized recording of riparian characteristics surrounding the station were made with the use of ACG's Streamside Checklist (please see Appendix III). Stream flow measurements were gathered using a Price 121 Type AA flow velocity meter.

5.2.2 Surface Water Quality

In 2002, ACG developed a network of eleven (11) Environmental Monitoring Stations (EMS) with two additional sites established in 2005. These stations have been physically marked on the ground and GPS referenced for ease of data management and mapping. The locations were chosen to capture existing baseline conditions upstream and downstream from the property, with the intention that they continue to be used by company personnel through the production life of the mine, to post closure monitoring. At each EMS, ACG has collected water samples and sediment samples from the stream for analysis of various physiochemical parameters, conducted measurement flows, and characterized the stream substrate and riparian habitat.

The results have also been compared to the Canadian Environmental Quality Guidelines for the Protection of Aquatic Life and Community Water Supplies.

The baseline water quality data to date indicates that a few metals were found in slightly elevated concentrations at select locations. These metals include aluminum, cadmium, copper, iron, selenium, silver, uranium and zinc.

A full report on water quality sampling from 2002 to 2005 is included in Appendix III.

5.2.3 Hydrogeology

Groundwater was not intercepted in boreholes during past drill programs; however, past drilling programs did not encompass the entire area where the decline will be driven. The geotechnical drilling program to be completed in fall 2005 will provide more information on groundwater depths and hydrogeology of the project site. Any water intercepted during

the decline development will be settled in cross drifts and used to supplement dust control and/or brought to surface for further settling and treatment/evaporation.

5.2.4 Fisheries

Sidney Creek, Iron Creek below the falls (at UTM 591550.58E 6748934.53N Zone 8 NAD 83), and the lower Boswell River have been identified as the only streams within the environmental study area to potentially contain salmon species and Arctic grayling. During fish studies in the summer of 2005, three slimy sculpin (*Cottus cognatus*) were found in the upper Boswell River and within the environmental study area.

The Boswell River adjacent to the proposed mine site, is not known to contain Chinook salmon (Oncorhynchus tshawytscha) or Arctic grayling (Thymallus arcticus). There is a large waterfall and smaller chutes approximately 5 km upstream of the mouth with the Teslin River that restricts the access of Chinook salmon to the project area.

Gee traps were set at all Environmental Monitoring Stations in July 2005. Salmon species and Arctic grayling were not present in these streams. A detailed fisheries study is attached to this report in Appendix III.

The Teslin Renewable Resource Council councillors have visited Sidney Creek and have indicated that area residents use Sidney Creek for fishing when they are in the area hunting, trapping, berry picking or camping. It has also been indicated that these water systems are used by Chinook salmon and Arctic grayling for spawning and rearing.

Four species of fish, including Chinook salmon, Arctic grayling, northern pike (Esox lucius), and slimy sculpin, were captured in the upper watershed of Sidney Creek.

The Teslin Tlingit Council (TTC) has identified Sidney Creek as a traditional fishing area. The Council has carried out studies in conjunction with the Salmon Enhancement Program in the area.

5.2.5 Stream Sediments

Stream sediment samples were taken in 2002 and 2005. Triplicate samples of fined grained sediments were collected from exposed portions of the bank and analyzed for metal levels. Elevated levels (above CCME interim sediment quality guidelines) of arsenic, cadmium, chromium, copper, and zinc were found at most EMS. The highest concentrations of metals were found at TM 09 and TM 10 on Red Mountain Creek, TM 11 on Chalco Creek, and TM 12 on Slate Creek where most results exceeded the probably effect level set by the CCME (CCME 2005).

A detailed report on water quality and sediments is attached to this report as Appendix III.

5.3 ATMOSPHERIC ENVIRONMENT

5.3.1 Climate

The climate in the Pelly Mountains Ecoregion is cold and semiarid with a mean annual temperature of –3.0 degrees Celcius (°C). The summer mean temperature is 10.5°C and the winter mean for the ecoregion is –17.5°C. Mean annual precipitation ranges from 500 mm – 1000 mm, varying with elevation (Environment Canada, 2005)

A meteorological station was installed at the site in July 2005. This station collects data on rainfall, air temperature, soil temperature, barometric pressure, wind speed, solar radiation, and relative humidity. Information from the meteorological station will be downloaded in the fall of 2005 and again periodically throughout the duration of the project. Data collected will be used in the calculation of appropriate water balances for the study drainages.

5.4 HUMAN ENVIRONMENT

5.4.1 Land Use and Land Tenure

Tintina owns 196 claims on Red Mountain. South of the Tintina claims are 30 claims owned by ATAC Resources. To the northeast of the Tintina claims are 20 claims owned by Heli-Ventures Ltd. (Figure 12).

The proposed exploration project and access route is located within three trapping concessions; registered trapline # 311 held by Larry Whitfield, # 313 held by Lena and Guy Moon, and # 314 held by Martha Vanheel and George Bahm. There is also one outfitting concession held by Craig Yakiwchuk. Mr. Yakiwchuk uses the existing airstrip to bring clients into the area for hunting and fishing.

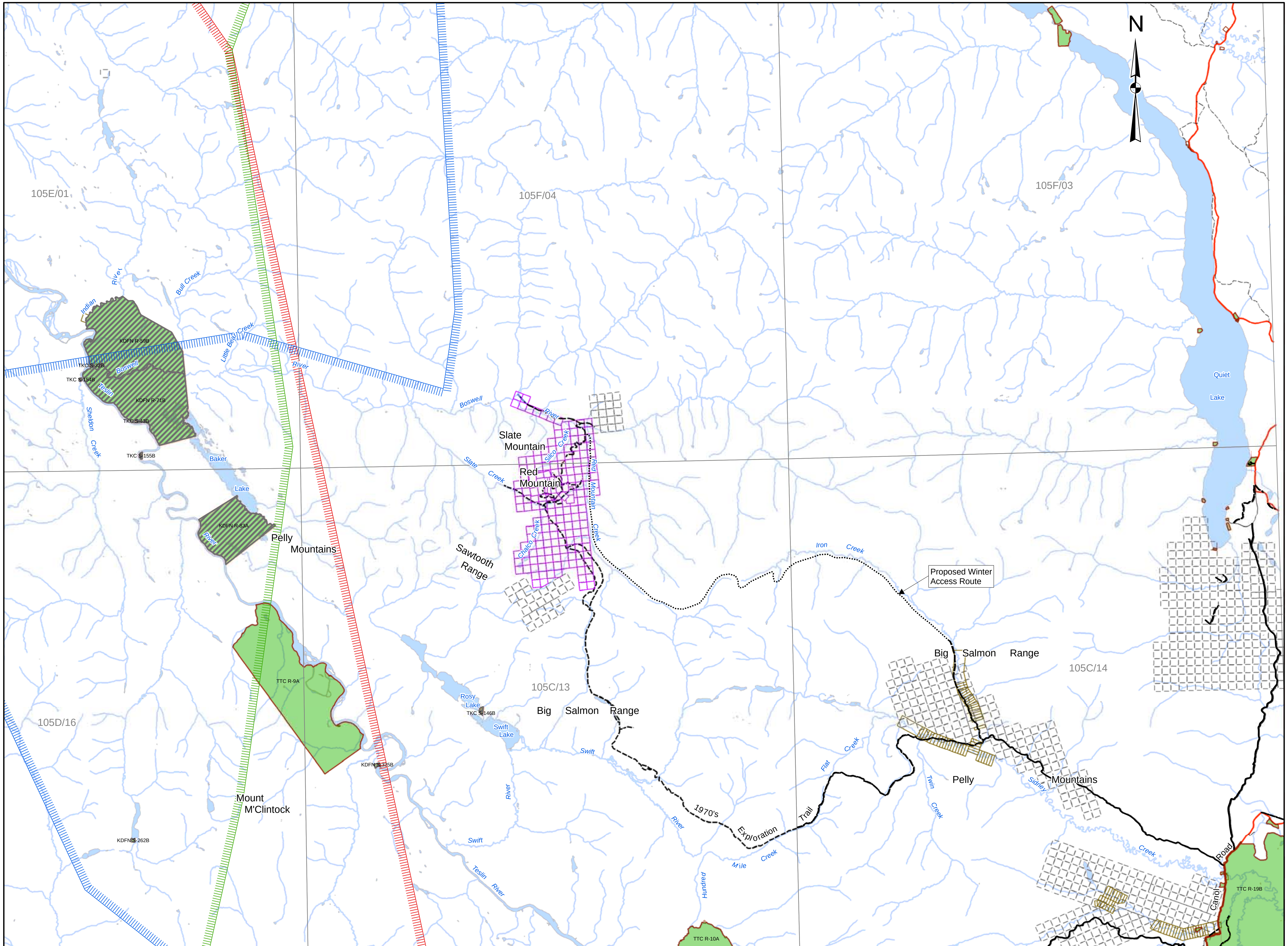
The project study area is within the Teslin Tlingit traditional territory. The Teslin Tlingit First Nation uses Sidney Creek for fishing.

In order to identify traditional sites in the study area, information was gathered from:

- Interviews with the TTC to determine traditional land use activities and possible site locations; and
- The Canadian Heritage Information Network for potential background data of the site.

5.4.2 Heritage Resources and Archaeology

C. Thomas of Thomas Heritage Consulting was contracted to conduct a detailed evaluation of heritage resources and archaeological sites in the project area. A preliminary assessment of the project area delineated high to low potential for heritage or archaeological sites. Follow-up ground truthing and testing by hand methods is planned in conjunction with the fall 2005 baseline work. Please refer to Appendix III for a more detailed review on heritage resources and archaeology.



Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Legend

- Road
- Secondary Road
- Trail
- Proposed Winter Access
- Contour
- Water Course
- Water Body
- Airstrip
- 105C/13 NTS Boundary and Number
- Legal Survey Lands (Teslin Tlingit)
- First Nations Settlement Land (Unsurveyed)
- Tintina Mines Mining Claims
- Other Mining Claims
- Placer Mining Claims
- Kwanlin Dun Traditional Territory
- Ta'an Kwach'an Traditional Territory
- Teslin Tlingit Traditional Territory

Projection: UTM Zone 8 NAD83 Units: Meters
NTS Sheets: 105C/13, 105C/14, 105D/16, 105E/01, 105F/03, 105F/04
NRCAN Legal Survey Data Current as of August 2005;
Digital quartz claims data current as of July 15, 2005, data downloaded from http://www.geomaticsyukon.ca/
Unsurveyed First Nation Settlement land data obtained from Indian and Northern Affairs Canada, August 2005
TTC = Teslin Tlingit Council
KDFN = Kwanlin Dun First Nation
TKC = Ta'an Kwach'an Council

Current Land Use and Land Tenure

Figure 12

Scale: 1:200,000

ACCESS CONSULTING GROUP

Drawn by: HD/PI	Checked by: RM
Date: September 2005	

Our File: D:\Projects\AllProjects\TML-05-01\gis\mxd\Report2005\Fig12_Landuse.mxd

5.4.3 Socioeconomic Conditions

The City of Whitehorse is located approximately 80 km (by air) southwest of the project site. The Village of Teslin is approximately 125 km southeast of the project site. The proposed project lies within the Teslin Tlingit Traditional Territory. Notifications of the project will be distributed throughout Teslin as well as to interested parties in Whitehorse. A public open house in Teslin is planned for late September prior to the commencement of the project.

There will be approximately 40 people employed during the development of the decline. Tintina will promote the hiring of qualified local personnel including members of the Teslin Tlingit First Nation.

The following information on the community of Teslin was taken from the 2004 Edition of *Yukon Community Profiles* complied by the Government of Yukon and Yukon Chamber of Commerce (http://yukoncommunities.yk.ca).

The economy in Teslin includes traditional subsistence activities, tourism, and territorial government highway, forestry, and social services. The major employer is the TTC. Tourism activities include accommodation, food services, transportation services, cultural activities, and outfitting and guiding services. Tle-nax Tawei Inc., the economic development arm of the TTC, promote tourism, outfitting, and a sawmill in the area.

Teslin is 183 km from the City of Whitehorse, which are connected by the Alaska Highway. A 1,700 m gravel all season runway is located in Teslin. Float plane access is also available from Teslin Lake.

The TTC offer social services that include social counsellors, a community health representative, community education liaison coordinator, and youth worker.

Further development of the Red Mountain mine project will require further permitting and licensing. Tintina understands that permits and licenses will undergo environmental screening and assessment under the Yukon Environmental and Socio-Economic Assessment Act (YESAA), scheduled to be implemented in November of 2005.

Accordingly, preparation for these subsequent applications will include significantly enhanced impact assessments in the future. Please also see "*Socio-Economic Effects*" (Section 7.3.5.3) later in this report.

6.0 PUBLIC CONSULTATION

Consultation with the TTC has been initiated by Tintina and will continue throughout the project planning and development stages. C. Thomas of Thomas Heritage Consulting has also been in contact with the TTC with regards to heritage and archaeological sites. Members of the TTC accompanied ACG staff during the fall water quality sampling and heritage surveys. This gives the TTC an opportunity to come familiar with the project site and to identify potential significant areas within the study boundary.

An outfitter who operates within the study area as well as trapline concession holders were contacted regarding the project. Similar interviews with local area land users were also conducted as part of the wildlife interviews (see Appendix III).

The following individuals have been interviewed for information about the site. There assistance is greatly appreciated.

- Bahm, George. Co-holder (with Martha Vanheel) of trap line No. 314;
- Carey, Jean. Sheep biologist, Yukon Territory;
- Florkiewicz, Rob. Southern Lakes regional biologist, Government of Yukon;
- McClelland, Jaimie. Caribou technician, Government of Yukon;
- Hassard, Bob. Outfitter in area 1970 – 1985;
- Moon, Guy & Lena. Currently trapping line No. 313 and formerly No. 314;
- Vanheel, Martha. Local First Nations Elder. Octogenarian;
- Yakiwchuk, Craig. Present outfitter in the area – Lone Wolf Outfitting, Whitehorse, Yukon Territory;
- Ward, Rick. Moose biologist, Government of Yukon;
- Westover, Sue. Moose technician.

The owner of a placer mine operation at Iron Creek will be contacted regarding the project and the open house.

An open house in the Village of Teslin will be scheduled for fall 2005. The open house will include a discussion of the project that will allow for public input.

Project information posters have been developed to provide project overview and details on pertinent aspects of the environmental studies and impact assessment conducted to date. Poster components include:

- Project Overview;
- Project Components;
- Project Study Area; and
- Project Environmental Studies.

As mentioned in Section 5.4.3, socioeconomic consultation further advances in the Red Mountain Project will involve enhanced public consultation throughout the life of the project. Tintina will provide Newsletter updates in conjunction with future public consultation.

7.0 POTENTIAL ENVIRONMENTAL AND SOCIOECONOMIC EFFECTS AND PROPOSED MITIGATION

7.1 ENVIRONMENTAL ASSESSMENT APPROACH

This section identifies potential environmental and socioeconomic effects that may be associated with the advanced exploration project, and proposes mitigation measures to eliminate or minimize these potential effects.

The environmental assessment included the identification of Valued Ecosystem and Cultural Components (VECC's) and an assessment to determine whether or not the exploration project is predicted to cause significant adverse environmental effects on each identified VECC, after the implementation of appropriate mitigation measures. The following section consists of an assessment of potential adverse effects as a result of the Red Mountain advanced exploration project, using known baseline environmental data from the environmental assessment study area, with proposed mitigation measures.

Examples of mitigation measures that have been integrated into the advanced exploration project engineering design components to minimize potential environmental effects include:

- minimizing project footprint through use of existing infrastructure (airstrip, exploration trails, camp, staging areas);
- engineering of the decline portal to reduce new disturbances to vegetation, soils, and wildlife habitat; and
- selection of the decline portal has been chosen on the basis of engineering requirements (length, slope) and location to minimize environmental effects, as well as to avoid draining conditions at the end of the exploration program.

To determine whether or not the potential adverse environmental effects were considered significant, six criteria were taken into consideration to determine significance. The first five descriptors follow those identified in "*The Responsible Authority's Guide to the Canadian Environmental Assessment Act"* prepared by the Federal Environmental

Assessment Review Office (FEARO) in 1994. The descriptor for economic and social context has been added to assist in addressing potential socioeconomic effects from the project. The descriptors include magnitude, geographic, duration, reversibility, ecological context, and economic and social context.

Table 9 provides a summary of the assessment of potential environmental effects, a listing of mitigation measures, and a determination of the significance of the potential effects. The ecosystem and cultural components that were evaluated for potential environmental effects include: atmospheric; topography; soils (including permafrost); surface water quality and hydrology; groundwater hydrology; aquatic resources including fisheries resources, benthic invertebrates; wildlife and habitat; vegetation; land use capability; and, socio-economic effects including public health and safety.

Subsequent sub-sections within this section support the environmental assessment for the advanced exploration project and present the determination of VECC's, the details of the effects assessment, and mitigation measures for various environmental and socioeconomic conditions. A cumulative effects assessment is also presented along with and environmental monitoring plans, and a review of previous environmental assessments.

7.2 VALUED ECOSYSTEM AND CULTURAL COMPONENTS (VECC'S)

The following information has been included from the *"Administrative Procedures for Environmental Assessment of Major Mining Projects in the Yukon*" prepared by Government of Yukon in September 2004.

VECC's are defined as elements of the environment, which are valued for environmental, scientific, social, aesthetic or cultural reasons. Selecting the project specific VECC's or indicators are essential for focusing impact assessments and the determination of significance of effects.

Table 9 Summary of the Assessment of Potential Environmental Effects Resulting from the Proposed Red Mountain Project

Parameters	Potential Environmental Effect	Mitigation	Significance of Effects							Significant
			Duration	Geographic Extent	Magnitude	Reversibility	Ecological Context	Economic & Social Context	Overall Rating	(Y/N)
Atmospheric	fugitive dust - exploration trails, access road fugitive dust - staging area, portal vehicle/equipment emissions	road watering watering proper maintenance	Very Low	Low	Low	High	Low	Low	Low	**N**
Topography	road cuts - access road, exploration trails facility area cuts - exploration	recontoured and revegetated recontoured and revegetated	Low	Low	Low	High	Low	Low	Low	**N**
Soils (including permafrost)	stripping and erosion of soils - access roads stripping and erosion of soils - facility area	stockpiling of overburden for cover/revegetation, prevent erosion stockpiling of overburden for cover/revegetation, prevent erosion	Low	Low	Low	High	Low	Low	Low	**N**
Surface Water Hydrology	stream crossings - access roads drill program - water use	bridge crossing on Sidney Creek, culverts on other drainages minimize use, use non fish bearing steams	Very Low	Low	Low	High	Low	Low	Low	**N**
Surface Water Quality	sediments - access road sediments - exploration program infiltration of metals with recharge to Boswell River surface waters - exploration	minimize instream construction, maintain vegetation buffer zones minimize instream construction, maintain vegetation buffer zones segregation of ARD waste on lined pad treatment of wastewater	Low	Very Low	Low	High	Medium	Medium	Low - Medium	**N**
Groundwater Hydrology	water use exploration program	segregation of ARD waste on lined pad waste management	Low	Very Low	Low	High	Medium	Low	Low - Medium	**N**
Fisheries: Water Quality **Habitat loss**	sediments - access roads sediments - exploration metals - exploration program decrease in surface flows during exploration	minimize instream construction, maintain vegetation buffer zones minimize instream construction, maintain vegetation buffer zones segregation of ARD waste on lined pad, no discharge to surface water water recycling, monitor surface flows	Very Low	Very Low	Low	High	Medium	Medium	Low - Medium	**N**
Benthic Macro invertebrates	sediments - access road sediments - exploration metals - exploration program decrease in surface flows - exploration program	minimize instream construction, maintain vegetation buffer zones minimize instream construction, maintain vegetation buffer zones segregation of ARD waste on lined pad, no discharge to surface water water recycling, monitor surface flows	Very Low	Very Low	Very Low	High	Low	Low	Low	**N**
Periphyton	sediments - access road sediments - exploration metals - exploration program decrease in surface flows - exploration program	minimize instream construction, maintain vegetation buffer zones minimize instream construction, maintain vegetation buffer zones segregation of ARD waste on lined pad, no discharge to surface water water recycling, monitor surface flows	Very Low	Very Low	Very Low	High	Low	Low	Low	**N**
Wildlife	Direct habitat loss Indirect habitat loss, avoidance, habitat fragmentation Harassment Hunting & poaching pressure Road kills	revegetating revegetating no wildlife harrassment policy on-site no hunting policy, no firearms policy, access management posted speed limits and wildlife crossings, access management	Low	Low	Medium	Medium	Medium	Medium	Medium	**N**
Vegetation	Removal of vegetation - access roads Removal of vegetation - exploration	revegetating revegetating	Low	Low	Low	High	Low	Low	Low	**N**
Land Capability & Historic Use Trapping Traditional/Cultural Use	 Decrease in wildlife populations, decrease trapping success Decrease in access to wildlife and cultural pursuits	 provide access and revegetation provide access and revegetation	Low	Low	Low	High	Low	Medium	Low - Medium	**N**
Socioeconomic Effects Local community Human Health & Safety (Accidents)	 Increase positive and negative local social effects Effects of health/livelihood/community	 community communication and consultation Health & safety plans, EMS, Training, Monitoring	Low	Low	Low	Medium	Medium	Medium	Low - Medium	**N**

The approach to selecting VECC's and indicators has been based on the following:

- identification of impacts to affected resources, rather than to specific VECC's or indicator species;
- First Nation consultations and VECC's importance ranking;
- determination of species vulnerability by reviewing the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) lists; and
- determination of which species or VECC's are likely to be affected based on issues identification.

The spatial boundaries for identifying VECC's are the same as the boundaries proposed for the environmental assessment study area, which are primarily based on the potential geographic extent of effect. However, for certain VECC's a regional context is more appropriate for certain wildlife species, such as moose, which move into and out of the study area boundaries. The identification of socioeconomic/cultural VECC's is presented in a regional context, including the City of Whitehorse, Teslin and the Yukon Territory as a whole. Input from the public (Section 6.0), including traditional knowledge, has contributed to the identification of VECC's.

Table 10 provides a complete list of the VECC's within the environmental assessment study area and within a regional context that will be effected by the project and rational for their selection. Consultation with the TTC, communities, regulatory agencies, knowledge of local environmental conditions and best professional judgment lead to the selection of the project VECC's.

Table 10 Identification of Valued Ecosystem and Cultural Components (VECC's)

Component Type	Rationale For Selection
Environmental	
Air Quality	Fugitive dust and gaseous emissions.
Surface Water Quality	Receiving waters for possible effluent discharge; support downstream aquatic resources
Groundwater	Possible infiltration of metals/nitrogen compounds with recharge to Boswell River surface waters.
Permafrost	Disturbance of permafrost at site.
Fisheries Resources – lower Boswell River and Sidney Creek Juvenile Chinook Salmon Arctic Grayling	Sensitive fish species; important commercial and native food fisheries; downstream indicator. Species of importance for First Nations and sport fisheries.
Wildlife Resources Moose Southern Lakes Caribou Herd Sheep Grizzly bear	Direct/indirect habitat loss, avoidance, habitat fragmentation, increased harvest pressure, road kills on South Canol.
Socioeconomic/Cultural	
Traditional Use – Trapping	Trapping concession provides employment benefits and sustenance lifestyle.
Traditional Use – Wildlife and Cultural	Wildlife, fish, berries, plant harvesting support sustenance lifestyle and cultural pursuits.
Outfitter	Outfitter operates in area, uses airstrip for clients
Heritage Resources	Potential for heritage resources in EA study area
Social	FN and local community resources and infrastructure required to support the project.
Economic	FN and local community interested in economic and employment benefits and opportunities resulting from the project.
Human Health and Safety	Worker health and safety on the project. Public health and safety.

7.3 SUMMARY OF POTENTIAL ENVIRONMENTAL AND SOCIOECONOMIC EFFECTS AND PROPOSED MITIGATION

This section summarizes the key potential environmental effects for the project and proposed mitigation measures.

7.3.1 Terrestrial Environment

To protect the terrestrial habitat, Tintina will make best effort to:

- minimize project footprint;
- use existing infrastructure (exploration trails, staging areas, and airstrip) to minimize disturbances;
- instruct equipment operators not to disturb ground unnecessarily;
- implement procedures, if fire hazards exist in the area during operations, to prevent inadvertent fires; and
- implement and follow, in the event of a spill, a Fuel Spill Contingency Plan. Spills will be immediately reported to the Spill Report Line;
- Reclaim new site disturbance by recontouring and revegetating; and
- Implement the ARD/ML management plan.

7.3.1.1 Wildlife

To protect wildlife, Tintina will undertake:

- a “no hunting” policy. The policy will be strictly enforced for company and contractors' employees while working within the project area;
- a “no firearms” policy. Firearms will be banned from company and contractor controlled operations except as authorized for protection of employee’s safety while in the field;
- a “no wildlife harassment” policy. This policy will encompass no wildlife feeding, employee wildlife education, and wildlife avoidance. The policy will be strictly enforced for company and contractors' employees while working within the project area, and include provisions for:

- prohibiting the personal use by employees of non-company or contractor all terrain vehicles (ATV's) and the after hour use of company or contractor recreational vehicles for non-company activity within the project area; and
- ensuring that employees comply with Government of Yukon policy with respect to bear management and bear education programs;
- enforcing waste management at camp and work sites.

7.3.2 Aquatic Environment

To protect aquatic resources, Tintina will make best efforts to:

- minimize alteration of the beds or banks of watercourses;
- maintain no disposal of waste materials, wastewater, or drilling fluids directly into watercourses in a manner than may result in seepage into watercourses;
- monitor and treat, if necessary, of any wastewater released for land application due to unforeseen circumstances (i.e. excessive precipitation);
- segregate waste to control and prevent metals from the drill program from circulating through the environment;
- store liquid fuels and oils in a closed system during transportation and on site. No fuels will be stored within 100 m of a watercourse;
- implement and follow, in the event of a spill, the Fuel Spill Contingency Plan. Spills will be immediately reported to the Spill Report Line;
- test and monitor ice conditions and follow appropriate construction and vehicle operation procedures on winter access. Recovery procedures for vehicles will be in place; and
- Implement the ARD/ML management plan.

7.3.3 Atmospheric Environment

To protect air quality, Tintina will make best effort to:

- ensure equipment is in good working order in compliance with the energy intensity policy;
- provide suitable and operational monitoring equipment;
- follow all safety, environmental, and emergency response procedures; and

- employ qualified supervisory personnel and providing suitable safety and environmental training to site personnel.

7.3.4 Effects of the Environment on the Project

To reduce disruptions by the environment on the project, Tintina will make best effort to:

- be flexible with scheduling to accommodate changes in environmental conditions;
- use existing infrastructure, staging areas, exploration trails, and airstrip to minimize disturbances;
- minimize project footprint;
- maintain proper and routine servicing of all equipment and vehicles;
- restrict vehicle and equipment movement during soft ground operations;
- implement procedures, if fire hazards exist in the area during operations, to prevent inadvertent fires;
- test and monitor ice conditions and following appropriate construction and vehicle operation procedures on the winter access road. Schedule changes and alternative delivery methods (aircraft) will be implemented in the event environmental changes affect usability of the winter access;
- avoid avalanche and landslide hazards;
- avoid permafrost conditions where possible; and
- reclaim new site disturbances by recontouring and revegetating.

7.3.5 Human Environment

7.3.5.1 Cultural Resources

To protect cultural resources, Tintina will make best effort to:

- notify local land users in the project area in advance of commencement of the underground exploration program;
- protect known traditional use and archaeological sites;
- survey the project area for potential cultural resources;
- ensure local community participation in traditional use or heritage surveys; and
- modify the work plan and site activities to protect important cultural resources, if found and will report any discoveries to the Chief of Mining Land Use.

7.3.5.2 Accidents and Malfunctions

A Fuel Spill Contingency and Emergency Response Plan is provided in Appendix II, which outlines response protocols for petroleum product spills. The purpose of this plan is to minimize effects of environmental disturbances and the resultant hazard to people, aquatic systems, and wildlife.

Special mitigative measures for the exploration area including containment structures, response equipment, and the presence of trained spills-response personnel will be instituted to minimize the possibility of contamination of watersheds adjacent to these facilities.

All employees working at the site will be familiar with the Fuel Spill Contingency Plan. Employees will understand the potentially hazardous situations that spills can create to the health and safety of workers and the environment. They will understand their responsibilities as employees to prevent, identify, report, and appropriately deal with a spill. The plan will be available for viewing by all employees and the company will advise employees of revisions or changes to the plan.

To prevent accidents and malfunctions and their associated impacts on the environment, Tintina will make best effort to:

- provide suitable and operational monitoring and emergency equipment, including fuel spill equipment;
- ensure proper handling and storage of fuels and hazardous substances;
- implement fuel transfer procedures;
- install suitable and operational safety devices on explosive gases;
- maintain proper and routine servicing of all equipment and vehicles;
- provide suitable safety and environmental training to site personnel, including manuals and plans;
- employ qualified supervisory personnel to monitor operations;
- follow all safety, environmental protection, and emergency response procedures; and

- establish a high order of preparedness in the event a spill occurs by implementing and following, in the event of a spill, the Fuel Spill Contingency Plan. Spills will be immediately reported to the Spill Report Line.

7.3.5.3 Socioeconomic Effects

This section lists the measures that will be adopted during the exploration program to minimize socioeconomic effects, maximize socioeconomic benefits, and protect traditional land use.

Employment

To promote employment benefits, Tintina will make best effort to:

- provide public forums so that potential employees can obtain information about the project;
- maximize the employment opportunities for qualified residents within the local communities near the project operations;
- provide first preference to qualified local residents for employment opportunities;
- provide equal gender employment opportunities;
- ensure that subcontractors agree to the company's undertakings and policies for employment of northern residents;
- conduct the program in a manner that maximizes local business opportunities for local and other Yukon businesses and which promotes the development of local and other Yukon business capacity, so long as they are qualified, meet Tintina's health, safety and environment standards and are cost competitive;
- identify goods and services requirements in advance of need in order to allow First Nations and other northern businesses to plan as required; and
- make local suppliers of goods and services aware of potential opportunities that may arise from the program.

Training

To improve workforce qualifications, Tintina will make best effort to:

- work in conjunction with local governments to address education and training opportunities for local community residents;

- provide employee orientation and instruction, upon hiring and deployment to the work area, in order to prepare employees for their work experience and to conduct their job safely and effectively;
- ensure that contractors and employees comply with a non-alcohol and non-prescription drug use policy; and
- liaise with Yukon Chamber of Mines and Government of Yukon, Energy Mines & Resources, to input to and benefit from proposed Mine Training Centre.

Health and Safety

To provide a safe and healthy work environment, Tintina will make best effort to:

- provide employees and contractors with safety orientations and Health, Safety & Environment training which explains employee rights and responsibilities;
- ensure all employees and contractors adhere to a Safety Plan and other safety and environmental measures;
- hire contractors with responsible safety records; and
- employ on-site safety supervisors responsible for inspecting work sites to ensure safe practices.

Traditional Land Use

To protect traditional ways of life, Tintina will make best effort to:

- work with local First Nations and other stakeholders to identify areas that are important for renewable resource harvesting, in order to avoid conflicts where possible, and to devise mitigative measures that will minimize disruption where contact is unavoidable;
- provide public forums for stakeholders to communicate with and provide feedback to company representatives;
- provide local trappers and land users in the project area with notification of planned operations and timing; and
- monitor wildlife in the area to help protect wildlife during all field-based operations.

7.3.6 Decommissioning

The scope and intensity of decommissioning activities for the project will be determined directly by the success of the advanced exploration program. Should results from the summer advanced exploration confirm grade and deposit estimates from the preliminary drilling, thereby leading the proponent to prepare for further mine development and production, decommissioning of infrastructure and associated reclamation of lands associated with these project elements would not be carried out following the advanced exploration.

If, however, the expected results are not achieved in the summer exploration program, or other unforeseen factors lead Tintina to discontinue further exploration and development at the site, the company will undertake a decommissioning program at the site. The following activities are intended to meet Operating Conditions related to final decommissioning. These measures are intended to effectively:

- leave the site clean following project completion;
- remove hazardous materials and petroleum products including items from previous work such as tanks and storage buckets; and
- re-contour major cuts and side slopes, prevent long-term erosion/slumping and promote successful revegetation of disturbed areas.

The decommissioning goal, should reclamation be required, will be to return the site as close as possible to its pre-program condition.

To ensure slope stability and erosion control, the following *Best Management Practices* will be integrated into the final decommissioning activities:

- the decline portal will be plugged using apron materials;
- re-contouring/re-sloping of disturbed areas to a 1:2 slope should be achievable in most locations, with contouring aimed at matching natural topography;
- runoff control measures such as slope drains, cross drains or rock-lined ditches will be employed where feasible (during the project where possible, otherwise during

decommissioning activities) to minimize the requirements for more expensive and less effective erosion and sediment control by diverting runoff and decreasing flow velocities;

- long slopes (>15 m high) will be benched and slopes will be roughened mechanically across contour to discourage rill- and gully-type erosion and to provide growing sites for revegetation;
- where possible, topsoil from disturbed areas will be stockpiled for use in preparing reclaimed areas for re-establishment of vegetation;
- where native vegetation is not expected to re-establish naturally, an appropriate native seed mixture and fertilizing regime will be selected and applied;
- sensitive sloped areas (stream banks) will be seeded and appropriate erosion control measures will be employed, such as the installation of coconut fiber blankets;
- where blankets are not feasible, woodchip mulch will be applied;
- periodic monitoring of the run-off and erosion control measures will be conducted, and if failing in sensitive areas, sediment control measures (silt fences, check dams, straw dikes) may be employed and monitored to prevent sediment transport into streams; and
- sediment control measures will be instituted in areas of high run-off/sediment transport potential (adit apron) to avoid downstream sedimentation (this may include sump/silt trap construction or use of slash windrows and natural vegetation buffers).

In addition to progressive cleanup during each phase of the operations, the following measures will be employed with respect to cleanliness and waste disposal upon the decision to permanently forego further exploration/development at the site being taken:

- all machinery, materials, fuel drums, used hydrocarbons, and metal waste will be removed from the site including items on site previous to the advanced exploration program;
- all non-combustible solid camp waste will be backhauled to the Teslin Municipal Waste Facility;
- compacted areas will be loosened and prepared for revegetation measures if necessary;

- hauling PAG material underground, if required in accordance with ARD/ML mitigation plan;
- fire hazard will be reduced by burning slash piles in accordance with a valid Burning Permit; and
- wildlife hazards (barbed wire, glass or plastic debris) will be removed.

Regardless of the exploration success achieved by the summer activities at the project site, Tintina will undertake some basic clean-up activities on the site:

- clean-up of sample bucket storage area; and
- removal of old barrels and drums.

Inspection of decommissioning activities carried out by the company's environmental consultant along with a TTC representative.

7.3.7 Follow-up Monitoring

To ensure that there are no long-term effects from the project and remediation activities have been successful, Tintina will make best efforts to:

- monitor areas affected by the project and reclamation success; and
- conduct site visits by company representatives to assess mitigation implementation and success.

7.4 CUMULATIVE ENVIRONMENTAL EFFECTS

Cumulative effects refer to those effects on the environment that result from effects of a project when combined with those of other past, existing, and imminent projects and activities. To address cumulative effects, a project's activities must be considered in context to actual or potential impacts on the environment from other sources.

The approximate spatial boundaries for assessing cumulative effects are the same as the boundaries proposed for the environmental assessment study area, which are based on the potential geographic extent of effect. The geographic boundary for the project site has been identified as the Red Mountain Creek drainage area, including the project access

route (see Figure 6 for environmental study area). The assessment of cumulative socioeconomic and economic effects is presented in a regional context, including the city of Whitehorse and the Yukon Territory as a whole.

The cumulative assessment included the following:

- revisit the identified VECC's and identify environmental effects from the project's activities on these components;
- identify other likely projects or activities that would occur in the study area during the Red Mountain exploration program, and assess linkages and cumulative effects from other potential projects or activities with project related effects;
- consider mitigation measures and evaluate significance of cumulative effects; and
- summarize findings of cumulative effects assessment.

Table 11 provides a listing of VECC's and rationale for their selection. To summarize, the VECC's for the project include:

- air quality;
- surface water quality;
- groundwater;
- permafrost;
- fisheries resources – lower Boswell River and Sidney Creek: chinook salmon;
- wildlife resources: moose, southern lakes caribou herd;
- traditional use – trapping;
- outfitting;
- heritage resources;
- social;
- economic; and
- human health and safety.

7.4.1 VECC's Project Interactions

With the VECC's identified; the potential interactions between the project disturbances or activities and the VECC were then assessed. Interactions within the spatial boundaries of the study area as well as regionally were also considered. Table 11 provides a summary

of the possible types of project environmental effects, the VECC's effected, and an assessment of mitigative measures designed to address potential effects. As noted in Table 11, all project effects are mitigable.

7.4.2 Other Projects and Activities

With an understanding of the potential effects to VECC's resulting from the project, interactions with any likely projects or activities that would occur during the Red Mountain exploration program have been considered. The Red Mountain exploration program is located in a relatively remote area and other regional activities are limited. The current activities in the region include:

Current Land Uses:

- traditional use;
- subsistence and recreational harvesting of wildlife and fisheries;
- trapping (three traplines); and
- one outfitter.

Other: In addition to considering current land uses, which may cumulatively interact with the project, consideration was also given to interactions, based on future land use activities. Upon review of the current land use activities, the potential future land use activities were identified as follows:

- possible further mineral exploration.

However, the likelihood of these other activities being undertaken is not known.

Table 11 Identification of Local Effects on VECC's and their Mitigation (Table modified after DIAND, 1997)

Possible Types of Project Effects	VECCs Affected	Effects Mitigable ?		Mitigation Description
		Y	N	
Environmental				
Altered air quality	air quality, wildlife, human health and safety	X		dust control procedures, monitoring and maintenance
Altered surface water quality	surface water quality, fish, wildlife, traditional use	X		controlled release of effluent to the receiving environment during the exploration program, ARD waste rock segregated on lined pad, minimize instream construction, buffer zones, spill plan, monitoring and maintenance
Altered groundwater quality	groundwater, fish, wildlife, traditional use	X		ARD waste rock segregated on lined pad, containment berms, spill plan, groundwater monitoring systems
Disturbance of permafrost	permafrost, groundwater	X		road alignments chosen and constructed to avoid exposing permafrost, use of existing infrastructure
Altered fish habitat	fish	X		no waste/wastewater disposal directly or indirectly into watercourses, ground water wells, spill plan, monitoring and maintenance
Sensory disturbance/habitat alienation	wildlife	X		no wildlife harassment policy, on-site no hunting policy, no firearms policy, posted speed limits and wildlife crossings
Habitat fragmentation	wildlife	X		revegetation
Direct wildlife mortality	wildlife	X		no wildlife harassment policy, on-site no hunting policy, no firearms policy, posted speed limits and wildlife crossings
Cultural				
Reduced wildlife resource use/harvest	traditional use	X		trappers to be consulted, known trails to be avoided
Loss of cultural value	heritage resources	X		known heritage resources not to be disturbed, further investigations to be completed prior to project construction, discovery of new sites will be reported to appropriate persons
Erratic economic development	economic	X		widespread employment distribution, including local community
Altered human health	human health and safety	X		safety orientations, HSE training, spill plan implementation, operational safety devices, routine monitoring and maintenance

Note: This table is an example of possible effects on VECC's. All effects may not be applicable to this project however, mitigation will be followed if effect is encountered.

7.4.3 Interactions and Significance Assessment

Once all of the potential effects to VECC's, as a result of project related activities, were assessed, an interaction assessment was completed and a significance ranking assigned to determine potential cumulative effects. Significant rankings were based on DIAND, 1997 guidelines (Hegmann, et al, 1997) and defined in Table 12. Table 13 summarizes the results of assessment. The interaction assessment of the VECC's with the project related effects were based on three types of interactions: duration, magnitude, and geographic extent. Refer to Table 12 for the significance and ranking of effects descriptors. Overall significance rankings of low, moderate or high could be assigned to each VECC based on duration, magnitude and extent of interaction of effects associated with the project.

Table 12 VECC Project Interaction and Signi ficance Ranking for Potential Cum ulative Effects

VECC's	Duration of Effect	Magnitude of Interaction	Geographic Extent of Interaction	Significance Ranking
Air Quality	Short term	Low	Low	Low
Surface Water Quality	Short term	Low	Low	Low
Groundwater	Short term	Low	Low	Low
Permafrost	Short term	Low	Low	Low
Fisheries Resources – lower Boswell River and Sidney Creek (Chinook salmon)	Short term	Low	Low	Low
Wildlife Resources (moose, southern lakes caribou herd)	Short term	Medium	Low	Medium
Traditional Use – Trapping	Short term	Low	Low	Low
Heritage Resources	Short term	Low	Low	Low
Social	Short term	Low	Low	Low
Economic	Short term	Low	Low	Low
Human and Health Effects	Short term	Low	Low	Low

Legend: Level of interaction or significance ranking defined as low, moderate, or high and considers mitigation success. Where duration of interaction = short term (1-3 years); medium term (4-10 years); long term (>10 years); Magnitude of interaction defines magnitude of effects on VECC's; Extent of interaction = low (local); medium (regional); high (territorial or national).

After the interaction assessment and significance rankings were completed for project related environmental effects, effects were considered in combination with other project activities in the study area.

Table 13 presents a summary of the VECC interactions with other project activities and the significance of these effects were ranked. The types of other project activities' environmental effects were noted and summarized in the table. An evaluation was undertaken to determine the interaction of VECC's with other project activities and significance evaluated. The potential for cumulative interactions was then identified.

Table 13 VECC and Other Activities Effects Significance Rankings

VECC's	Significance Ranking	Other Activities Environmental Effects	Significance Ranking for Other Activities	Interaction for Cumulative Effects
Air Quality	Low	Low	Low	Low
Surface Water Quality	Low	Low	Low	Low
Groundwater	Low	Low	Low	Low
Permafrost	Low	Low	Low	Low
Fisheries Resources – lower Boswell River and Sidney Creek (chinook salmon)	Low	Low	Low	Low
Wildlife Resources (moose, southern lakes caribou herd)	Medium	Medium	Low	Medium
Traditional Use – Trapping	Low	Low	Low	Medium
Heritage Resources	Low	Low	Low	Low
Social	Low	Low	Low	Low
Economic	Low	Low	Low	Low
Human and Health Effects	Low	Low	Low	Low

Based on this evaluation, two VECC's have a potential for significant cumulative interactions, while all other VECC's have a low potential for significant cumulative interactions. However, activities associated with wildlife and trapping can be mitigated through communication with local resource users and with access management and site

control. With the appropriate mitigation measures applied, the cumulative effects to wildlife and trapping are not significant.

7.5 PREVIOUS ENVIRONMENTAL ASSESSMENTS

A Phase 2 Environmental Assessment was conducted at the Slate (Red) Mountain site in July 1996 by Environmental Services, Public Works and Government Services Canada (PWGSC, 1997). The assessment was conducted to evaluate environmental and human concerns with respect to: mine openings and workings; buildings and infrastructure; waste disposal areas; waste rock disposal areas; surface water including adit and waste rock seepage and receiving waters; and hazardous and non hazardous materials on the site. The primary concern outlined in the assessment was two large storage tanks and a number of barrels. These were in good condition but could degrade and result in hazardous waste spills. It was recommended that residual petroleum hydrocarbons remaining in the two storage tanks and barrels be incinerated at a common area either on or off site. The status of these storage tanks and barrels will be reviewed and measures taken to remove hazardous materials as part of the advanced exploration program.

An assessment report of the Red Mountain site was also prepared by DIAND Technical Services in 1994. This report presented the site location, work history, claim status, current site conditions, and recommendations for additional site investigations and site remediation. This recommendation is consistent with the 1997 PWGSC report.

7.6 ENVIRONMENTAL MONITORING PLANS

A Monitoring Program describing the proposed environmental, geotechnical, and operational monitoring requirements for the project will be developed. Environmental and physical monitoring programs are required at all stages of exploration. These programs are designed to monitor:

- the effectiveness of component design;
- mitigation success; and
- potential impacts to the receiving environment.

7.7 ENVIRONMENTAL ASSESSMENT CONCLUSION

Tintina has proposed an advanced exploration program that will involve the development of an underground exploration decline on the Red Mountain property. The project will be located on previously disturbed land that will minimize the project's footprint and environmental effects.

Tintina has developed specific mitigation measures, environmental protection, emergency response, health and safety and monitoring plans to ensure that potential effects to cultural and environmental features are minimized. An assessment has been completed to identify potential environmental and cumulative effects, and mitigation measures have been developed to address those effects. Potential effects have been assessed for significance using accepted criteria and residual effects have been identified. The project has a limited duration, and the geographic extent of the proposed program is small. Although the area has important ecological attributes, potential effects have a low magnitude and are considered highly reversible. Based on the assessment, the project is not likely to cause significant adverse environmental or socio-economic effects. Significant adverse cumulative environmental effects are not considered likely.

8.0 REFERENCES

Brown, P. and Kahlert, B., 1986. *Geology and Mineralization of the Red Mountain Porphyry Molybdenum Deposit, South-central Yukon; in Mineral Deposits of Northern Cordillera*. Canadian Institute of Mining and Metallurgy, Special Volume 37, pages 288-297.

Canadian Council of Ministers of the Environment
http://www.ccme.ca/assets/pdf/e1_062.pdf (2005)

Cigla, M., S. Yagiz and L. Ozdemir, 2001. *Application of Tunnel Boring Machines in Underground Mine Development*. Excavation Engineering & Earth Mechanics Institute, Department of Mining Engineering, Colorado School of Mines, Colorado, USA.

Department of Fisheries and Oceans (DFO), 1993. *The Yukon Placer Authorization and Supporting Documents.*

DIAND Technical Services, 1994. *Assessment Report 105C-13-1 Slate Mountain.*

Environment Canada, 2005. 178. Pelly Mountains. Website Accessed June 5, 2005. URL: http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc/borcor_e.cfm

FEARO, 1994. *The Responsible Authority's Guide to the Canadian Environmental Assessment Act*. Prepared by the Federal Environmental Assessment Review Office, September 1994.

Government of Yukon, Department of Highways and Public Works, Transportation Engineering Branch, 2004. *Project Description For Highway Reconstruction Km 1716.6 to Km 1723.6 Shakwak Project Segment 10D Yukon 2004.*

Hegmann G. and Green J. E. - Axys Environmental Consulting Ltd., 1997. *Users Guide for Screening of Cumulative Effects – Yukon DIAND Northern Affairs Program*. Prepared for Department of Indian Affairs and Northern Development.

Public Works and Government Services Canada (Environmental Services), 1997. *Phase II Environmental Assessment of the Slate Mountain Abandoned Mine Site.* Prepared for Action on Waste Program Indian and Northern Affairs Canada.

Sabag, S.F. 1992. *Red Mountain Molybdenum Deposit Summary Report.* Prepared for Amoco Canada Petroleum Company. Ltd.

Smith, C.A.S, Meilkle, J.C. and C.F Roots, 2004. *Ecoregions of the Yukon Territory, Biophysical Properties of Yukon Landscapes.* Agriculture and Agri-Food Canada, PARC Technical Bulletin 04-01, Summerland, BC, 313 p.

REFERENCES (Cont'd)

Templeman-Kluit, D.J., 1977. Geology Maps – Quiet Lake and Finlayson Map Areas; Geological Survey of Canada, Open File 486.

Templeman-Kluit, D.J., 1979. *Transported Cataclasite, Ophiolite and Granodiorite in Yukon; Evidence of Arc-Continent Collision*. Geological Survey of Canada, Paper 79.14.

Appendix I

Acid Rock Drainage and Metals Leachate Laboratory Results

Client : **Access Consulting Group**
Project : **Red Mountain**
CEMI Project : **0537**
Test : **24 Hour Distilled Water Leach Extraction Test at 3:1 Liquid to Solid Ratio**
Test Date :

Leachate Analysis By ICP-MS/OES

Sample Name:		RM-05-01	RM-05-02	RM-05-03	RM-05-04	RM-05-05	RM-05-06	RM-05-07	RM-05-08	RM-05-09	Blank
Rock Type		**QED**	**Quartz Mica Schist**	**Chlorite Schist**	**Hornfels**	**>0.300% MoS2**	**>0.100 - <0.200% MoS2**	**>0.200 - <0.300% MoS2**	**QED**	**QMP**	
Location		O/C	O/C	O/C	DDH RMY 81-25: 297-319m	DDH RMY 81-24: 837-855m	DDH RMY 81-24: 381-393m	DDH RMY 81-24: 501-519m	DDH RMY 81-25: 198-210m	DDH RMY 81-25: 51-66m	
Dissolved Metals											
Parameter	Units										
Aluminum Al	mg/L	0.31	0.11	0.036	0.091	0.087	0.028	0.029	0.039	0.21	0.001
Antimony Sb	mg/L	< 0.001	< 0.001	< 0.001	0.006	0.006	0.005	0.003	0.002	< 0.001	< 0.0002
Arsenic As	mg/L	0.008	0.001	< 0.001	0.004	0.006	0.003	0.002	0.001	< 0.001	< 0.0002
Barium Ba	mg/L	0.002	0.006	0.082	0.025	0.053	0.027	0.032	0.046	0.08	< 0.0002
Beryllium Be	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0002
Bismuth Bi	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0002
Boron B	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01
Cadmium Cd	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0005	0.0003	< 0.00004
Calcium Ca	mg/L	0.29	15.2	2.47	14.1	14.6	14.1	15.5	25.8	1.13	< 0.01
Chromium Cr	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0002
Cobalt Co	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.003	< 0.0002
Copper Cu	mg/L	0.004	0.003	0.002	0.002	0.002	0.003	0.001	0.001	0.056	< 0.0002
Iron Fe	mg/L	0.16	0.05	< 0.05	0.06	< 0.05	0.06	0.06	0.07	0.59	< 0.01
Lead Pb	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.0002
Lithium Li	mg/L	< 0.001	0.001	< 0.001	0.003	0.003	0.004	0.002	0.002	0.006	< 0.0002
Magnesium Mg	mg/L	< 0.05	0.92	0.51	5.26	1.6	8.36	6.57	5.53	0.4	< 0.01
Manganese Mn	mg/L	0.01	0.006	0.01	0.031	0.012	0.01	0.011	0.064	0.032	< 0.0002
Mercury Hg	ug/L	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Molybdenum Mo	mg/L	< 0.0005	0.0007	< 0.0005	0.032	0.452	0.039	0.11	0.0031	0.0052	< 0.0001
Nickel Ni	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	0.004	< 0.0002
Phosphorus PO4	mg/L	0.2	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.03
Potassium K	mg/L	1.6	2.6	1	1.7	1.4	2.1	1.8	2.7	4.7	< 0.02
Selenium Se	mg/L	0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	0.001	< 0.001	0.003	< 0.0002
Silicon SiO2	mg/L	6.2	4.1	3.6	2.6	3	3.9	3.1	2.9	4.2	0.11
Silver Ag	mg/L	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00025	< 0.00005
Sodium Na	mg/L	0.42	0.41	0.83	1.19	6.18	5.57	6.03	1.02	1.74	< 0.01
Strontium Sr	mg/L	0.001	0.034	0.009	0.29	0.37	0.28	0.38	0.3	0.007	< 0.0002
Tellurium Te	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0002
Thallium Tl	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0003	< 0.00002
Thorium Th	mg/L	0.0043	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0001

Sample Name:		RM-05-01	RM-05-02	RM-05-03	RM-05-04	RM-05-05	RM-05-06	RM-05-07	RM-05-08	RM-05-09	Blank
Rock Type		**QED**	**Quartz Mica Schist**	**Chlorite Schist**	**Hornfels**	**>0.300% MoS2**	**>0.100 - <0.200% MoS2**	**>0.200 - <0.300% MoS2**	**QED**	**QMP**	
Location		O/C	O/C	O/C	DDH RMY 81-25: 297-319m	DDH RMY 81-24: 837-855m	DDH RMY 81-24: 381-393m	DDH RMY 81-24: 501-519m	DDH RMY 81-25: 198-210m	DDH RMY 81-25: 51-66m	
Tin Sn	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0002
Titanium Ti	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0002
Uranium U	mg/L	0.0005	< 0.0005	< 0.0005	0.0014	0.0026	0.0075	0.017	0.0048	< 0.0005	< 0.0001
Vanadium V	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	0.003	0.001	< 0.001	< 0.001	< 0.001	< 0.0002
Zinc Zn	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.013	0.027	< 0.001
Zirconium Zr	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.002

Client : **Access Consulting Group**
Project : **Red Mountain**
CEMI Project : **0537**
Test : **24 Hour Distilled Water Leach Extraction Test at 3:1 Liquid to Solid Ratio**
Date : **July 26, 2005**

SAMPLE	ROCK TYPE	LOCATION	DISTILLED WATER VOLUME (mL)	SAMPLE WEIGHT (g)	pH	CONDUCTIVITY (uS/cm)	ALKALINITY (mg $CaCO_3$/L)	ACIDITY (pH 4.5) (mg $CaCO_3$/L)	ACIDITY (pH 8.3) (mg $CaCO_3$/L)	SULPHATE (mg/L)
RM-05-01	QED	O/C	750	250	5.04	8	2.3	<1.0	10.0	2
RM-05-02	Quartz Mica Schist	O/C	750	250	7.81	80	47.3	<1.0	2.3	<1
RM-05-03	Chlorite Schist	O/C	750	250	6.82	20	10.8	<1.0	3.8	<1
RM-05-04	Hornfels	DDH RMY 81-25: 297-319m	750	250	7.75	121	34.0	<1.0	2.3	31
RM-05-05	>0.300% MoS2	DDH RMY 81-24: 837-855m	750	250	7.89	116	43.5	<1.0	1.8	19
RM-05-06	>0.100 - <0.200% MoS2	DDH RMY 81-24: 381-393m	450	150	8.10	158	56.8	<1.0	2.3	30
RM-05-07	>0.200 - <0.300% MoS2	DDH RMY 81-24: 501-519m	750	250	7.93	171	41.25	<1.0	4.25	47
RM-05-08	QED	DDH RMY 81-25: 198-210m	450	150	7.92	172	41.0	<1.0	2.5	49
RM-05-09	QMP	DDH RMY 81-25: 51-66m	750	250	4.15	70	0.0	3.8	13.8	21
Blank			750	-	5.28	1	1.8	<1.0	3.3	<1

CLIENT : Access Consulting Group
PROJECT : Red Mountain
PROJECT # : 0537
TEST : Metals by Aqua Regia digestion followed by ICP
Date : Aug 3, 2005

Sample	ROCK TYPE	LOCATION	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	K %	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sn ppm
RM-05-01	QED	O/C	<0.2	0.4	<5	45	<0.5	<5	0.07	<1	<1	158	<1	0.76	0.15	0.04	225	6	0.04	3	61	6	<5	1	<10
RM-05-02	Quartz Mica Schist	O/C	<0.2	2.03	7	128	0.6	<5	3.9	<1	13	256	18	3.13	0.74	1.44	615	3	0.05	35	457	5	<5	4	<10
RM-05-03	Chlorite Schist	O/C	<0.2	1.74	<5	72	<0.5	<5	0.37	<1	20	171	21	1.19	0.06	2.3	213	<2	0.03	121	302	<2	<5	<1	<10
RM-05-04	Hornfels	DDH RMY 81-25: 297-319m	<0.2	1	6	94	<0.5	<5	0.76	<1	13	330	35	2.78	0.56	1.14	283	244	0.03	66	814	20	<5	7	<10
RM-05-05	>0.300% MoS2	DDH RMY 81-24: 837-855m	<0.2	0.73	5	178	<0.5	<5	1.48	<1	6	326	43	1.99	0.33	0.51	206	1953	0.03	48	793	<2	<5	5	<10
RM-05-06	>0.100 - <0.200% MoS2	DDH RMY 81-24: 381-393m	<0.2	0.74	<5	196	<0.5	<5	2.09	<1	6	281	14	1.76	0.33	0.48	196	695	0.03	14	497	7	<5	4	<10
RM-05-07	>0.200 - <0.300% MoS2	DDH RMY 81-24: 501-519m	0.3	0.44	<5	256	<0.5	<5	1.29	<1	<1	236	13	1.19	0.2	0.25	108	1691	0.02	10	424	33	<5	1	<10
RM-05-08	QED	DDH RMY 81-25: 198-210m	1.6	0.28	7	107	<0.5	20	1.58	18	7	176	99	2.38	0.23	0.37	272	77	0.02	12	898	220	<5	<1	<10
RM-05-09	QMP	DDH RMY 81-25: 51-66m	0.5	0.3	33	276	<0.5	<5	0.01	<1	2	181	59	2.42	0.5	0.02	12	208	0.03	5	407	22	<5	2	<10

Sample	ROCK TYPE	LOCATION	Sr ppm	Ti %	V ppm	W ppm	Y ppm	Zn ppm	Zr ppm
RM-05-01	QED	O/C	4	<0.01	2	<10	7	23	4
RM-05-02	Quartz Mica Schist	O/C	73	0.06	37	<10	9	56	6
RM-05-03	Chlorite Schist	O/C	13	0.1	15	<10	<1	14	<1
RM-05-04	Hornfels	DDH RMY 81-25: 297-319m	17	0.05	90	<10	8	37	5
RM-05-05	>0.300% MoS2	DDH RMY 81-24: 837-855m	58	0.02	48	<10	8	19	3
RM-05-06	>0.100 - <0.200% MoS2	DDH RMY 81-24: 381-393m	41	0.03	19	<10	9	27	4
RM-05-07	>0.200 - <0.300% MoS2	DDH RMY 81-24: 501-519m	46	<0.01	<1	21	8	45	3
RM-05-08	QED	DDH RMY 81-25: 198-210m	38	<0.01	6	29	6	1470	12
RM-05-09	QMP	DDH RMY 81-25: 51-66m	26	<0.01	5	<10	1	2	5

CLIENT : Access Consulting Group
PROJECT : Red Mountain
PROJECT # : 0537
TEST : Modified ABA
Date : July 25, 2005

Sample ID	ROCK TYPE	LOCATION	Paste pH	S(T) %	S(SO4) %	S(S-2) %	AP	NP	Net NP	Fizz Test
RM-05-01	QED	O/C	6.1	0.02	<0.01	0.02	0.63	-1.2	-1.8	none
RM-05-02	Quartz Mica Schist	O/C	8.7	0.03	<0.01	0.03	0.94	103.2	102.3	strong
RM-05-03	Chlorite Schist	O/C	8.9	0.06	<0.01	0.06	1.88	8.5	6.6	none
RM-05-04	Hornfels	DDH RMY 81-25: 297-319m	8.8	2.17	0.01	2.16	67.50	29.2	-38.3	none
RM-05-05	>0.300% MoS2	DDH RMY 81-24: 837-855m	8.5	1.51	0.02	1.49	46.56	35	-11.6	strong
RM-05-06	>0.100 - <0.200% MoS2	DDH RMY 81-24: 381-393m	8.5	1.14	0.02	1.12	35.00	48.7	13.7	strong
RM-05-07	>0.200 - <0.300% MoS2	DDH RMY 81-24: 501-519m	8.4	0.98	0.03	0.95	29.69	31.3	1.6	moderate
RM-05-08	QED	DDH RMY 81-25: 198-210m	8.5	2.43	0.03	2.40	75.00	47.1	-27.9	strong
RM-05-09	QMP	DDH RMY 81-25: 51-66m	5.3	1.02	0.69	0.33	10.31	-1.6	-11.9	none
Duplicate										
RM-05-01			6.0	0.02	<0.01	0.02	0.63	-0.9	-1.5	none

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from calculated sulphide sulphur content: S(T) - S(SO4).

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET NP = NP - AP

Appendix II

Fuel Spill Contingency and Emergency Response Plan

SPILL RESPONSE PLAN FOR PETROLEUM PRODUCTS (FUELS)

September 2005

Prepared By:

ACCESS CONSULTING GROUP

A Registered Tradename for Access Mining Consultants Ltd.
accessconsulting.ca

Introduction

Fuel use/handling activities will be undertaken during the mobilization/demobilization of the TBM and the development of the decline. These activities involve the use of equipment that consume petroleum products, including refuelling and storage of other hydrocarbons.

This Spill Response Plan is a guide for the contractors and subcontractors as to the planned course of action in the event of a spill or leakage of petroleum products during the course of the operation. Safety procedures for personnel and for proper equipment usage during such operations are discussed within this plan.

This plan outlines procedures to be followed in the event of a petroleum product spill. A table of contact phone numbers is provided below in Table 1.

Table 1 Spill Related Resources and Contact Numbers

Resource	Contact Number
Yukon Spill Line	**(867) 667-7244**
Hospital – Whitehorse	**(867) 667-8700**
Fire Department – Whitehorse	**(867) 668-8699 or (867) 668-2462**
Police – Whitehorse	**(867) 667-5555**
Access Consulting Group (Environmental Consultant)	**(867) 668-6463**
YG Department of Environment Monitoring and Inspections Section	**(867) 667-3227**
YG Environmental Protection Branch	**(867) 667-3436**

PETROLEUM PRODUCT SPILLS

Spills and leaks are addressed herein.

A, **"spill"** is defined as:

> "Petroleum product or lubricant which is poured, spilled, or pumped onto the ground or into water, by faulty conveyance or transfer, overturned vehicles or equipment, or through human error or negligence."

Severity rating:
- Non-Reportable – Less than 100 litres*
- Minor – More than 100 litres and Less than 400 litres
- Major – More than 400 and Less than 1,000 litres
- Emergency - More than 1,000 litres

*If a spill is less than 100 litres and has not entered a watercourse, the Owner and/or operator do not have to report the spill.

A **"leak"** is defined as:

> "Passing of a petroleum product through a breach, tear or puncture in a container, or receptacle at a rate of less than 10 litres per minute."

Please find a table of reportable spills for various substances in Appendix A.

Reporting Procedures

The following two levels of reporting is required by any individual who locates a spill or leak:

Report to a Supervisor: Refers to the direct supervisor in charge of the individual who located the spill or leak.

and,

Report to the Owner: The Owner shall immediately be given details of any leak or spill. It is the Owner's responsibility to ensure protection of human health and safety, provide directions to stop or contain spills, and report the spill (if necessary, see severity rating and notes above) to affected agencies prior to investigating the spill themselves.

Affected Agencies: Affected Agencies shall all be contacted through the 24-hour emergency spill response line at ***(867) 667-7244***.

The following information shall be conveyed to the affected agencies through the 24-hour Emergency Spill Response Line. This information should be documented on the "Spill Reporting Form" provided in Appendix B.

- Location of the Spill or Leak
  - Nearest community, town, highway, major water body, kilometre location on highway if known etc.
- Time of Spill
- Severity of Spill or Leak
  - Minor – more than 100 litres and less than 400 litres
  - Major – more than 400 litres and less than 1,000 litres
  - Emergency - more than 1,000 litres
- Type of Spill
  - Total loss/leakage
  - Overturned vehicle or tanker (plus name of transport company)
  - Ruptured tank
  - Lost drum
- Product Spilled
  - Diesel Fuel (Identify Grade)
  - Gasoline
  - Lubricant (Identify Grade)
  - Other (Identify)
- Nearest Watercourse
  - Identify by name and description the nearest watercourse, pond or lake, with an approximate distance to the spill.
  - Describe the soils conditions and direction of probable flow for the spilled product.
- Potential to enter surface water
- Fire Hazard
- Hazard to life and limb, injuries
- Environmental effect expected, if any
- Equipment and clean-up consumables on hand

Response by Affected Agencies depends upon the location of the possible spill and will vary. However, they will be co-ordinated by phoning the Emergency Response Spill Line ***(867) 667-7244***. For the purpose of this Plan, it is recommended that only one call be made to government or other agencies using the 24 hour spill line.

Other affected parties may include organizations associated with fuel supply and transport companies or local First Nations. Most major suppliers in the Yukon are members of the Transportation Emergency Assistance Plan (TEAP). One of the responsibilities of this organisation is the sharing of resources, consumables, equipment and personnel in the event of a spill. The transporter is responsible for contacting TEAP in the event of a spill.

The Canadian Transport Emergency Centre (CANUTEC), a branch of Transport Canada, can also be contacted for 24 hr technical advise on Dangerous Goods, as needed. The CANUTEC – help line for dangerous goods is **0 (613) 996-6666 (collect)**.

Emergency Spill Response Procedure

The first person on the scene is to do the following:

Ensure personal and worker safety, if you cannot identify the spilled substance consider it dangerous.

If Personnel Are Injured
- Call for medical help, attend to injured person, and administer first aid if safe to do so.
- Warn / remove bystanders

If Safe (do not enter confined spaces or expose self to fire hazard)
- Stop all sources of ignition and stop or reduce the source flow of the spill
- Shut off all valves
- Shut off all electrical power
- Initiate containment: put down sorbent pads and berm spill area, if possible
- Recover product and contaminated soil / other materials
- Remain at the site and assist with response as needed when help arrives.

If Unsafe
- Initiate evacuation (upgrade or upwind), move to safe area
- Notify Owner
- Report the following: location, initial spill site, possible cause, description of present condition, affecting or about to enter water.
- Isolate area and deny entry until qualified response personnel arrive
- Deny access to all unauthorized personnel
- Update Owner on spill status

Response for Gasoline Spills

If in water and if safe to do so:

1. Stop or reduce discharge, if safe to do so, by plugging, uprighting, adjusting valves, or other suitable method.
2. If possible, contain discharge by booming using commercial boom material, logs, or other material at hand.
3. If in rapidly flowing water, direct to quieter backwater using booms to deflect material.
4. Ensure that you have reported the spill.
5. Remove from water by skimming, using absorbents, and collect in suitable container (tanks, drums, plastic lined depression in ground or snow). **See Appendix C for a listing of typical spill response tools/equipment**.

NOTE: IN THE EVENT MATERIAL IS SPILLED DURING VERY WARM WEATHER AND THERE IS DANGER OF FIRE DUE TO FUMES, DO NOT ATTEMPT TO CONTAIN PRODUCT ON WATER. ALLOW PRODUCT TO DISPERSE AND EVAPORATE.

6. Dispose absorbents by recycling or incineration if conditions are suitable and after consultation with environmental authorities and/or forestry officials contacted through the Emergency Spill Response Line.

Response for Gasoline Spills (Cont'd)

If on land and it is safe to do so:

1. Stop, or reduce discharge if safe to do so by plugging, uprighting, adjusting valves or other suitable method.
2. Contain spill by diking with earth, snow and ice or other barrier, possible trenching or creating a lined sump down gradient from the spill source.
3. Ensure that you have reported the spill.
4. Remove fuel from containment area with pumps, vacuum equipment and place in appropriate containers. Ensure equipment intrinsically safe (does not have a source of ignition/spark).
5. Absorb residual liquid on natural or synthetic absorbents (e.g. 3M products).
6. Remove contaminated soils in the spill site to an appropriate disposal site if spill located near water supply or stream/river course or for aesthetic reasons.
7. Dispose of contaminated fuel by recycling or incineration. In situ, incineration may be possible if permission granted from environmental and forestry officials contacted through the Emergency Spill Response Line.

Response for Diesel Spills

If in water and if safe to do so:

1. Stop, or reduce discharge if safe to do so by plugging, uprighting, adjusting valves, or other suitable method.
2. If possible, contain discharge by booming using commercial boom material, logs or other material at hand.
3. If in rapidly flowing water, direct to quieter backwater using booms to deflect material.
4. Ensure that you have reported the spill.
5. Remove from water by skimming, using absorbents, and collect in suitable container (tanks, drums, plastic lined depression in ground or snow).

6. Dispose by recycling or incineration, if conditions are suitable and regulatory authorities grant permission.

Response for Diesel Spills (Cont'd)

If on land and it is safe to do so:

1. Stop or reduce discharge if safe to do so by plugging, uprighting, adjusting valves or other suitable method.
2. Contain spill by diking with earth, snow or ice or other barrier, possible trenching or creating a lined sump down gradient from the spill source.
3. Ensure that you have reported the spill.
4. Remove fuel from containment area with pumps, vacuum equipment and place in appropriate containers.
5. Absorb residual liquid on natural or synthetic absorbents (e.g. 3M products).
6. Remove contaminated soils in the spill to an appropriate disposal site if spill site is located near water supply or stream/river course or for aesthetic reasons.
7. Dispose of contaminated fuel by recycling or incineration. In site, incineration may be possible if permission granted from environmental and forestry officials.

Hazardous Materials Information

Gasoline

Characteristics
- Flammable
- Solubility in water 1 to 100 ppm
- Floats
- Flash point - 38 to -43 C

Human Health
- Moderately toxic by inhalation. Avoid prolonged exposure to fumes

Environment
- Harmful to aquatic life. Fish toxicity: 5 - 40 ppm rainbow trout

Protective Clothing
- No specific recommendations. Protective clothing is required.

Diesel

Characteristics
- Combustible/Flammable liquid
- Insoluble in water (30 ppm)
- Floats
- Flash point 52 to 96 C

Human Health
- Low toxicity by all routes

Environment
- Fish toxicity: 10 ppm rainbow trout; 2 ppm for grass shrimp

Protective Clothing
- Gloves and boots made from neoprene or butyl rubber

SPILL RESPONSE FOR PETROLEUM PRODUCTS (FUELS)

APPENDIX A

REPORTABLE SPILLS

A spill in excess of the following thresholds is considered a spill under the Yukon *Spill Regulations* (O.I.C. 1996/193), pursuant to the Environment Act. In this table, the listed regulations "Federal Regulations" means the *Transportation of Dangerous Goods Regulations* (Canada) Sor/85/77 of January 18, 1985.

Substance Spilled	TDG Code	Reportable Quantity
Explosives of Class 1 as defined in section 3.9 of the Federal Regulations.	1	Any amount
Flammable gases, of Division 1 of Class 2 as defined in section 3.11 (a) of the Federal Regulations.	2.1	Any amount of gas from a container larger than 100 L, or where the spill results from equipment failure, error or deliberate action or inaction.
Non-flammable gases of Division 2 of Class 2 as defined in section 3.11 (d) of the Federal Regulations.	2.2	Any amount of gas from a container larger than 100 L, or where the spill results from equipment failure, error or deliberate action or inaction.
Poisonous gases of Division 3 of Class 2 as defined in section 3.11(b) of the Federal Regulations.	2.3	Any amount
Corrosive gases of Division 4 of Class 2 as defined in section 3.11 (c) of the Federal Regulations.	2.4	Any amount
Flammable liquids of Class 3 as defined in section 3.12 of the Federal Regulations.	3	200 L (Any amount if spilled into a watercourse)
Flammable solids of Class 4 as defined in section 3.15 of the Federal Regulations.	4	25 kg
Products or substances that are oxidizing substances of Division 1 of Class 5 as defined in sections 3.17(a) and 3.18(a) of the Federal Regulations.	5.1	50 kg or 50 L
Products or substances that are organic compounds that contain the bivalent "-0-0-" structure of Division 2 of Class 5 as defined in sections 3.17 (b) and 3.18 (b) of the Federal Regulations.	5.2	1 kg or 1L
Products or substances that are poisons of Division 1 of Class 6 as defined in sections 3.19 (a) to (e) and 3.20 (a) of the Federal Regulations.	6.1	5 kg or 5 L
Organisms that are infectious or that are reasonable believed to be infectious and the toxins of these organisms as defined in sections 3.19(f) and 3.20(b) of the Federal Regulations.	6.2	Any amount
Radioactive materials of Class 7 as defined by section 3.24 of the Federal Regulations.	7	Any discharge or a radiation level exceeding 10 mSv/h at the package surface and 200 mSv/h at 1 m from the package surface.
Products or substances of Class 8 as defined by section 3.24 of the Federal Regulations.	8	5 kg or 5 L
Miscellaneous products or substances of Division 1 of Class 9 as defined by sections 3.27 (1) and 2 (a) of the Federal Regulations.	9	50 kg or 50 L

SPILL RESPONSE FOR PETROLEUM PRODUCTS (FUELS)

APPENDIX B

SPILL REPORTING FORM

Spill Reporting Form

1) Type: (check) Oil ____ Gasoline ____ Diesel ____ Sewage ____

   Other (name) _____

2) Source (Company): _____

3) Severity: (check) Minor 100 – 400 litres _____ Major 400 - 1,000 litres _____
   Emergency more than 1,000 litres _____

4) Date of Incident: _____ Time: _____

5) General Roadway Kilometre Mine Site Location: _____
___

6) Specifics of Location (nearest community, watercourse etc.): _____

_____

7) Cause of Incident (e.g.: building failure): _____

8) Reason: (e.g.: earthquake): _____

9) Weather Conditions: Temperature _____ Wind Direction/Speed _____ Precipitation _____

10) Hazards to human life or health: _____

11) Expected Environmental Effects: _____

12) Nearest Surface Water with Approximate Distance to Spill: _____

_____

13) Potential to Enter Surface Water: _____

14) Fish Kill: Yes ___ No ___ Bird Kill: Yes ___ No ___

15) Fire Hazard: _____

16) Threat to drinking water: _____

17) Who to contact at the scene: _____

   Company: _____ Phone: _____

18) General Comments: _____

19) How to prevent recurrence: _____

20) Action taken to date: Containment: _____

   Clean up: _____

Reported by:
Name: _____ Dept.: _____ Phone: _____

Reported to:
Name: _____ Dept.: _____ Phone:_____

SPILL RESPONSE FOR PETROLEUM PRODUCTS (FUELS)

APPENDIX C

LIST OF TYPICAL SPILL RESPONSE EQUIPMENT

List of Typical Spill Response Equipment

- **Absorbents** (For Petroleum Hydrocarbon {Fuels, Lubricants, and Solvents} and Wastewater)
  - Booms
  - Sheets
  - Towels
  - Absorbent granules

- **Contaminated Soils Recovery Tools**
  - Shovels
  - Picks
  - Excavators
  - Loaders
  - Trucks

- **Liquid Recovery Tools**
  - Pumps
  - Containers
  - Vacuum / Eductor Truck

- **Fire Suppression Equipment**
  - Various, for different material types

- **Personal Safety Equipment**
  - Protective Clothing
  - Eye Protection
  - Breathing Apparatus

Note:

This is by no means an exhaustive list of materials and tools that can be assembled and used for spill response.

More information on spill response equipment and equipment suppliers can be found on the Internet. Yukon Explosives in Whitehorse is an example of a local supplier.

Appendix III

Baseline Biophysical Summary Report 2002 – 2005

Report to:

Tintina Mines Ltd.

Summary Report
Phase I Baseline Biophysical Studies

2002-2005 Data Collection Program
Red Mountain Property
Yukon Territory, Canada

Prepared by:

Access Mining Consultants Ltd.

September 2005

ACCESS CONSULTING GROUP

** Access Consulting Group is a registered trade name for Access Mining Consultants Ltd.*

Table of Contents

Figures and Tables

Appendices

INTRODUCTION

This report contains a description of the objectives and methodology of the baseline biophysical studies that were conducted at the Tintina Mines Ltd. Red Mountain Property by Access Consulting Group (ACG) from 2002 to 2005. The report also contains a summary of the study results and several appendices, which contain the original laboratory analyses and other information respecting the baseline biophysical study activities.

OBJECTIVES

The objectives of the Phase I Baseline Studies are threefold:

1. To establish an understanding of the existing environmental conditions at the site, including:

    - Establishing a comprehensive network of biophysical baseline monitoring stations around the project site; focused initially at the various watercourses that may be influenced by future exploration and/or mining activity in the area;
    - Photographing and mapping the monitoring stations;
    - Characterizing riparian communities at each site;
    - Conducting water quality and stream sediment sampling;
    - Measuring stream flows and gathering general information on hydrological regimes in the area;
    - Undertaking a fisheries survey to document fish utilization and habitat descriptions in the study area;
    - Reviewing existing wildlife studies and data for the area, including interviews with local trappers, outfitters and other individuals knowledgeable of the study area;
    - Establishing a meteorological monitoring station on site to collect data for use in water balance calculations;

- Conducting an archaeological/heritage assessment of the study area; and
- Interpreting aerial photography and groundtruthing observations to delineate and describe existing vegetation units for the study area.

2. To support analysis and development of the Project Description for Phase I exploration and/or development activities; and

3. To prepare documentation in support of various applications for permits, authorizations, and/or licenses that the project requires in order for advanced underground exploration.

The studies comprising the baseline biophysical characterization are described in the following sections:

- ***Water Quality, Stream Sediment Quality, Hydrology, Meteorology*** (Access Consulting Group);
- ***Wildlife Resources*** (Grant Lortie);
- ***Fisheries Resources*** (Dave Petkovitch, Rem Ricks);
- ***Heritage/Archaeology*** (Thomas Heritage Consulting)

WATER QUALITY, STREAM SEDIMENT QUALITY, HYDROLOGY, METEOROLOGY AND VEGETATION

METHODOLOGY

Field visits were conducted in the summer/fall of 2002, 2003 and 2005. Fixed wing aircraft were mobilized from Whitehorse and a helicopter and four-wheeled ATVs were used to move field scientists around the project area. Table 1 provides descriptions and locations of the monitoring stations.

Table 1. Descriptions and Locations of Environmental Monitoring Sites

Site	Coordinates (UTM)	Description
TM-01	N 6766679 E 559840	Boswell River, downstream of confluence with Slate Creek
TM-02	N 6766470 E 560247	Slate Creek, above confluence with Boswell River
TM-03	N 6767183 E 565906	Unnamed Creek west of Airstrip before confluence with Boswell River
TM-04	N 6766999 E 566043	Boswell River, near airstrip
TM-05	N 6765736 E 568634	Silco Creek, upstream of confluence with Boswell River
TM-06	N 6765553 E 569875	Boswell River, downstream of confluence with Red Mountain Creek
TM-07	N 6765436 E 569954	Red Mountain Creek, upstream of confluence with Boswell River
TM-08	N 6765413 E 570208	Boswell River - background
TM-09	N 6762274 E 569771	Chalco Creek, upstream of confluence with Red Mountain Creek
TM-10	N 6761256 E 569882	Red Mountain Creek - background
TM-11	N 6759647 E 567354	Chalco Creek - background
TM-12	N 6762176 E 564787	Slate Creek near source
TM-13	N 6768927 E 543188	Boswell River downstream before confluence with Teslin River

During the 2002 site visit an ACG project scientist established 11 biophysical monitoring stations around the property and completed the initial round of water quality, streambed and riparian classification activities. Two more sites (TM-12 and TM-13) were established in July of 2005 in anticipation of further exploration at Red Mountain.

Once the field scientist reached the general area selected from the project area map for station establishment, a semi-permanent station post was established. This was done by blazing a tree trunk on four sides with an axe, placing hi-visibility flagging ribbon around the tree, and marking the station identification number on the blazes with an indelible marker. A Global Positioning System (GPS) measurement was also taken for exact location reference and refinement of the project mapping.

Upon completion of station establishment, the following environmental characterization activities ensued:

- Gathering water samples and stream sediment samples from the stream for analysis of various physiochemical parameters;
- Measurement of stream flows at the station;
- Characterization of the stream substrate at the station; and,
- Characterization of the riparian habitat in the area.

Standard methods were utilized for gathering, preserving, and storing water and sediment samples (Environment Canada, 2001a). All samples were kept cool and shipped for analysis the following day to Norwest Labs in Surrey, B.C.

Standardized recording of riparian characteristics surrounding the station were made with the use of ACG's Streamside Checklist (attached in Appendix A). Stream flow measurements were gathered according to standard practices (Environment Canada, 2001b) using a Price 121 Type AA flow velocity meter and wading rod, which is calibrated annually by the Government of Canada, Environment Canada, Calibration Services Section. Results are presented in Appendix B.

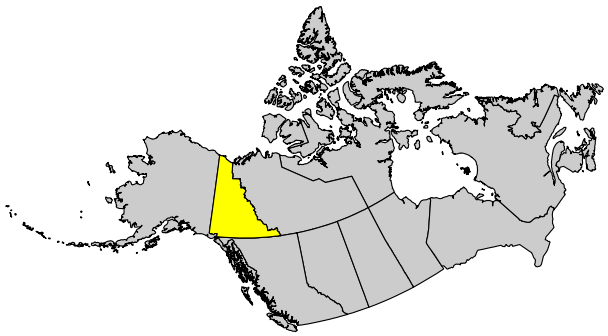
In July of 2005, an automated hydrometric station was established on the Boswell River at site TM-01. This included the installation of an in-stream staff gauge and a pressure-transducing data logger in a stilling well. The readings for water depth at the site, coupled with periodic flow measurements and cross-sectional survey information (to be collected during low flow in October 2005) will provide a continuous discharge record for the Boswell River at this location. Further hydrometric stations will be installed once exploration planning advances, with a view towards characterizing discharge regimes for the individual property watersheds.

A data-logging meteorological station was also established in July 2005 near the existing camp location on Red Mountain (see Fig B-2). This station will record year-round data for the following parameters:

- Incoming solar radiation;
- Air temperature and relative humidity;
- Barometric pressure;
- Soil temperature;
- Wind speed and direction; and
- Rainfall

These measurements will document local climatic conditions, allow for the formulation of water balance calculations on the property and provide a more precise data set of baseline meteorological information to be compared with regional data.

Figures B-1, B-2, and B-3 depict the general project location and provide an overview of the project study area and environmental monitoring stations.



ACCESS CONSULTING GROUP

Red Mountain Project

Yukon Territory

Baseline Study

Tintina Mines Limited

Drawn By: HD/PI	**Figure B-1**
Checked By: RM	Date: Sept. 2005

Our file:D:\Project\AllProjects\TML-05-01\gis\mxd\Report2005\BaselineReport\FigB1_Location.mxd

TM-01 (Hydrometric Station)
TM-02
TM-03
TM-04
TM-05
TM-06
TM-07
TM-08
TM-09
TM-10
TM-11
TM-12
TM-13
Boswell River
Slate Creek
Slate Mountain
Red Mountain Creek
Chalco Creek
N

Location of Boswell River Downstream Sampling Site

1:200,000

Red Mountain Project

Yukon Territory

Baseline Study

Tintina Mines Ltd.

Legend

- Trail
- Proposed Winter Access
- Contour
- Water Course
- Water Body
- Airstrip
- NTS Boundary and Number (105C/13)
- Water Quality Sample Sites
- Meteorological Station
- Waterfalls
- Tintina Mines Mining Claim
- Other Mining Claims

Projection: UTM Zone 8 NAD83
Units: Meters
NTS Sheets: 105 C/13, 105 C/14, 105D/16, 105E/01, 105F/03, 105 F/04

Site Overview With Environmental Monitoring Stations

Figure B-2

Scale: 1:50,000

0 250 500 1,000 1,500 2,000 2,500 m

ACCESS CONSULTING GROUP

Drawn by: HD/PI	Checked by: RM
Date: September 2005	

Our File: D:\Project\AllProjects\TML-05-01\gis\mxd\Report2005\BaselineReport\FigB2_MonStn.mxd

Red Mountain Project

Yukon Territory

Baseline Study

Tintina Mines Ltd.

105F/04

105F/03

105C/13

105C/14

N

Quiet Lake

Boswell River

Slate Creek

Slate Mountain

Silco Creek

Red Mountain

Red Mountain Creek

Chalco Creek

Sawtooth Range

Iron Creek

Proposed Winter Access Route

Big Salmon Range

Rosy Lake

Swift Lake

Swift River

Flat Creek

Twin Creek

Pelly Mountains

Sidney Creek

Canol Road

1970's Exploration Trail

Mile Hundred Creek

Teslin River

C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18

Legend

- Stream Crossing (C15)
- Water Quality Sample Sites
- Waterfalls
- Road
- Secondary Road
- Trail
- Proposed Winter Access
- Contour
- Water Course
- Water Body
- Airstrip
- NTS Boundary and Number (105C/13)

Projection: UTM Zone 8 NAD83
Units: Meters
NTS Sheets: 105C/13, 105C/14, 105F/03, 105F/04

Access Road Stream Crossings

Figure B-3

Scale: 1:125,000

0 1 2 4 6 km

ACCESS CONSULTING GROUP

Drawn by: HD/PI | Checked by: RM

Date: September 2005

Our File: D:\Project\ABProjects\TML-05-01\gis\mxd\Report2005\BaselineReport\FigB3_StreamXing.mxd

RESULTS

Water Quality

Water quality surveys were conducted in 2002, 2003 and 2005. The original laboratory results from Norwest Labs are available on CD. The water quality data returned slightly elevated concentrations of several metals: aluminum, cadmium, copper, iron, selenium, silver, uranium and zinc. All results have been compared to the Canadian Environmental Quality Guidelines for the Protection of Aquatic Life (CCME, 2001.)

A summary of the parameters exhibiting concentrations exceeding the CCME guidelines for the Protection of Aquatic Life is provided in Table 2. Complete surface water quality results follow in Table 3 and 4 (due to additional parameters added to the 2005 sampling regime, July 2005 surface water results are displayed in a separate table.)

Table 2. Summary of Water Quality Parameters Exceeding CCME Guideline for Protection of Aquatic Life.

Parameter	Year	Location	Comments
Total Aluminum	2002-2003	TM-01, TM-04, TM-05, TM-06, TM-07, TM-08, TM-09, and TM-10	Not a significant environmental concern at noted concentrations. Elevated aluminum concentrations found at the stations downstream of TM-09 and appear to be a function of loadings from Chalco Creek downstream of TM-11, but upstream of TM-09.
	2005	TM-04, TM-05, TM-07, and TM-09	
Total Cadmium	2002-2003	TM-01 through TM-10	Only very slightly elevated. Not a significant environmental concern at noted concentrations. Ubiquitous constituent in regional waters.
	2005	TM-04, TM-05, TM-06, TM-07, TM-08, TM-09, and TM-12	
Total Copper	2002-2003	TM-04, TM-05, TM-06, TM-07, and TM-09	Only very slightly elevated. Not a significant environmental concern at noted concentrations; may have effects on industrial water uses. Elevated total copper concentrations found at these stations appears to be a function of loadings from Chalco Creek downstream of TM-11, but upstream of TM-09 and from Silco Creek.
	2005	TM-05, TM-07, TM-09	
Total Iron	2002-2003	TM-02, TM-06, and TM-09	Only very slightly elevated. Not a significant environmental concern at noted concentrations; may have effects on industrial and drinking water uses. Elevated total iron concentrations found at these stations appears to be a function of loadings from Chalco Creek downstream of TM-11, but upstream of TM-09 and from Slate Creek. Substrate staining in Chalco Creek at TM-09 is reflective of the noted concentrations of this element in the creek water.
	2005	TM-09	
Total Selenium	2002-2003	TM-01	Only very slightly elevated. Not a significant environmental, drinking water, or industrial process concern at noted concentration.
	2005	TM-12	
Total Silver	2002-2003	TM-09 and TM10	Only very slightly elevated. Not a significant environmental, drinking water, or industrial process concern at noted concentrations.
	2005	n/a	
Total Uranium	2002-2003	TM-01, TM-03, TM-04, TM-06, TM-08,	Only very slightly elevated. Not a significant environmental concern at noted concentrations. Elevated concentrations found at these stations appear to be a function of loadings from the Boswell River and the un-named watercourse where TM-03 is situated.
	2005	n/a	
Total Zinc	2002-2003	TM-01, TM-02, TM-09	Only very slightly elevated. Not a significant environmental concern at noted concentrations.
	2005	TM-05 and TM-09	

Table 3 Red Mountain Surface Water Quality 2002 & 2003

	Lab Lot ID:*	200789-1	241298-1	200789-2	241298-2	201780-1	241373-1	201780-2	241373-2	201780-5	241373-3	201154-1	241373-4	Detection Limit	CCME
	Sample Date:	21-Oct-02	25-Jun-03	21-Oct-02	25-Jun-03	23-Oct-02	26-Jun-03	23-Oct-02	26-Jun-03	23-Oct-02	26-Jun-03	22-Oct-02	26-Jun-03		
	Sampler:	T.Ritchie	R. Gould	T.Ritchie	R. Gould	T.Ritchie	R. Gould	T.Ritchie	R. Gould	T.Ritchie	R. Gould	T.Ritchie	R. Gould		Water: Freshwater Aquatic Life
	Sample ID	TML-01	TML-01	TML-02	TML-02	TML-03	TML-03	TML-04	TML-04	TML-05	TML-05	TML-06	TML-06		
Inorganic Nonmetallic Parameters															
Ammonium - N Dissolved	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	**1.37-2.2**
Nitrogen Total	mg/L	<0.002	<0.06	<0.002	0.09	<0.002	0.53	<0.002	0.44	<0.002	<0.05	<0.002	<0.06	0.05	
Kjeldahl Nitrogen Total	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.52	<0.05	0.43	<0.05	<0.05	<0.05	<0.05	0.05	
Phosphorus Total	mg/L					<0.05		<0.05		<0.05		0.59		0.05	
Phosphate as P	mg/L	<0.05		<0.05		<0.05		<0.05		0.05		<0.05		0.05	
Metals Total (Trace)															
Aluminum Total	mg/L	**0.124**	0.1	0.018	<0.05	0.032	0.057	**0.22**	**0.169**	**0.206**	**0.202**	**0.319**	**0.668**	0.005	**0.005-0.1**
Antimony Total	mg/L	<0.0002	<0.002	<0.0002	<0.002	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	0.0006	<0.0002	<0.0002	0.0002	
Arsenic Total	mg/L	0.0003	<0.002	0.0002	<0.002	0.0003	0.0003	0.0003	0.0003	0.001	0.0009	0.0004	0.0004	0.0002	**0.005**
Barium Total	mg/L	0.022	0.019	0.048	0.043	0.005	0.005	0.02	0.016	0.027	0.025	0.024	0.013	0.001	
Beryllium Total	mg/L	<0.0001	<0.001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	
Bismuth Total	mg/L	<0.0005	<0.005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	
Boron Total	mg/L	<0.002	<0.02	<0.002	<0.02	0.004	0.006	0.003	0.005	0.002	0.004	0.008	0.004	0.002	
Cadmium Total	mg/L	**0.00006**	<0.00010	**0.00002**	<0.00010	<0.00001	**0.00012**	**0.00015**	**0.00011**	**0.00056**	**0.00041**	**0.00018**	**0.00014**	0.00001	**0.000017**
Calcium Total	mg/L	15.1	11.1	27.9	20.6	4.8	3.3	15.1	14.4	23	18.6	14.2	7.6	0.2	
Chromium Total	mg/L	<0.0005	<0.005	<0.0005	<0.005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	0.0005	**0.02-0.002**
Cobalt Total	mg/L	0.0001	<0.001	<0.0001	<0.001	<0.0001	<0.0001	0.0004	0.0002	0.0004	0.0003	0.0005	0.0003	0.0001	
Copper Total	mg/L	0.003	<0.01	0.001	<0.01	<0.001	0.001	**0.005**	0.004	**0.009**	**0.006**	**0.006**	0.002	0.001	**0.002-0.004**
Iron Total	mg/L	0.1	0.1	<0.1	**0.8**	<0.1	0.1	0.1	0.1	0.1	0.1	0.3	**0.8**	0.1	**0.3**
Lead Total	mg/L	<0.0001	<0.001	<0.0001	<0.001	<0.0001	0.0001	<0.0001	0.0002	0.0001	0.0001	<0.0001	0.0006	0.0001	**0.001-0.007**
Lithium Total	mg/L	0.003	<0.01	0.002	<0.01	0.004	0.002	0.003	0.002	0.003	0.002	0.003	0.004	0.001	
Magnesium Total	mg/L	3	1.7	5.7	3.1	0.7	0.4	2.5	2.2	5.4	3.9	2.3	9.2	0.2	
Manganese Total	mg/L	<0.005	0.006	<0.005	0.027	<0.005	<0.005	0.007	0.005	0.012	0.009	0.011	0.027	0.005	
Mercury		0.0025		0.0037		<0.0002		<0.0002		<0.0002		<0.0002		0.0002	
Molybdenum Total	mg/L	0.001	<0.01	<0.001	<0.01	0.001	0.001	0.003	0.003	<0.001	<0.001	0.002	0.004	0.001	**0.073**
Nickel Total	mg/L	<0.0005	<0.005	<0.0005	<0.005	<0.0005	0.0006	0.0012	0.0009	0.0028	0.0026	0.0012	0.0009	0.0005	**0.025-0.15**
Potassium Total	mg/L	0.4	0.7	<0.4	0.6	<0.4	0.5	0.6	0.7	0.8	0.8	<0.4	0.7	0.4	
Selenium Total	mg/L	0.0005	<0.002	**0.0011**	<0.0020	<0.0002	<0.0002	0.0007	0.0003	0.0009	0.0007	0.0003	<0.0002	0.0002	**0.001**
Silicon Total	mg/L	3.89	3.41	3.02	2.58	3.89	3.53	3.81	4.32	6.84	7.99	3.88	4.54	0.05	
Silver Total	mg/L	<0.0001	<0.001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	**0.0001**
Sodium Total	mg/L	1.6	2.2	1	0.9	2	1.3	1.7	2.1	2.4	2.3	1.1	1.6	0.4	
Strontium Total	mg/L	0.06	0.047	0.084	0.058	0.033	0.028	0.057	0.047	0.097	0.079	0.058	0.033	0.001	
Sulphur Total	mg/L	2.48	2.72	4.94	7.47	0.54	32	4.99	22.9	13	22.2	5.09	7.26	0.05	
Thallium Total	mg/L	<0.00005	<0.0005	<0.00005	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	**0.0008**
Tin Total	mg/L		<0.01		0.019		<0.001		<0.001		<0.001		<0.001	0.001	
Titanium Total	mg/L	0.0008	<0.005	0.0007	0.574	0.0006	0.0019	0.0014	0.0029	0.0016	0.0013	0.0034	0.0445	0.0005	
Uranium Total	mg/L	0.0023	<0.005	0.0005	<0.005	0.0036	0.0028	0.0022	0.0021	<0.0005	<0.0005	0.0013	0.005	0.0005	
Vanadium Total	mg/L	0.0001	<0.001	0.0001	0.0011	0.0002	0.0002	0.0002	0.0003	0.0001	0.0001	0.0003	0.0018	0.0001	
Zinc Total	mg/L	0.002	**0.044**	<0.001	**0.067**	0.002	0.009	0.008	0.009	0.027	0.025	0.009	0.013	0.001	**0.03**
Zirconium Total	mg/L	<0.001	<0.01	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
Physical and Aggregate Properties															
Solids Total Dissolved	mg/L	33		73		80		66800		147		113		5	
Solids Total Suspended	mg/L	2		<1		4		2		<1		3		1	
Temperature of observed pH and EC	°C	20.7	19	20.7	18.9	20.1	19.7	19.9	19.5	19.8	19.6	20.7	19.6	0.1	
Turbidity	NTU	0.6		0.1		0.5		1.4		2.5		2.5		0.1	
Routine Water															
Bicarbonate	mg/L	53	26	100	50	23	15	50	35	48	39	49	22	5	
Calcium Dissolved	mg/L	16.4	10.5	30.1	19	4.6	3.2	15.7	12.9	23.5	17.4	15.7	6	0.2	
Carbonate	mg/L	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	6	
Electrical Conductivity	uS/cm at 25C	113	72.6	199	126	36.6	27.8	110	79.2	178	138	105	54.6	1	
Hardness as CaCO3	mg/L	53.9	32.8	101	66.1	14.3	9.7	50.3	39.7	81.4	58.3	50.6	17.8	-	
Hydroxide	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	
Magnesium Dissolved	mg/L	3.2	1.6	6.3	3.1	0.7	0.3	2.7	1.8	5.5	3.6	2.8	0.7	0.2	
Nitrate - N	mg/L	<0.004	<0.004	<0.004	0.088	<0.004	0.005	<0.004	0.009	<0.004	0.01	<0.004	<0.004	0.004	
Nitrite - N	mg/L		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002	0.002	**0.06**
P-Alkalinity as CaCO3	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	
pH	pH units	7.72	7.55	8.02	7.88	7.28	7.21	7.59	7.53	7.67	7.52	7.47	7.35	0.01	**6.5-9.0**
Sulphate Dissolved	mg/L	9.8	6.5	18.8	12.7	1.6	1.6	16.7	14.3	43	40.2	13.5	9	0.02	
T-Alkalinity as CaCO3	mg/L	43	21	82	41	19	12	41	29	39	32	40	18	5	
Dissolved Oxygen	mg/L	5.8		5.7		6.1		6.2		6		5.7		0.1	
Manganese	mg/L	<0.005		<0.005		0.012		0.006		0.009		0.006		0.005	
Nitrate and Nitrite	mg/L	<0.006		<0.006		<0.006		<0.006		<0.006		<0.006		0.006	
Potassium	mg/L	0.5		0.4		<0.4		0.6		0.7		0.6		0.4	
Sodium	mg/L	3.5		3.2		1.7		1.5		2.5		1.3		0.4	

Note: *All samples analyzed at Norwest Labs (Surrey, BC). Empty cells represent analytes that were not sampled between the two sampling years.
- values in a yellow box exceed CCME guidelines for protection of aquatic life.

Table 3 Red Mountain Surface Water Quality 2002 & 2003 (Continued)

	Lab Lot ID:*	201154-2	241373-5	200789-3	241373-6	201154-3	241557-1	201154-4	241557-2	201154-5	241298-3	Detection Limit	CCME
	Sample Date:	22-Oct-02	26-Jun-03	21-Oct-02	26-Jun-03	22-Oct-02	30-Jun-03	22-Oct-02	30-Jun-03	22-Oct-02	25-Jun-03		
	Sampler:	T.Ritchie	R. Gould	T.Ritchie	R. Gould	T.Ritchie	R. Gould	T.Ritchie	R. Gould	T.Ritchie	R. Gould		Water: Freshwater Aquatic Life
	Sample ID	TML-07	TML-07	TML-08	TML-08	TML-09	TML-09	TML-10	TML-10	TML-11	TML-11		
Inorganic Nonmetallic Parameters													
Ammonium - N Dissolved	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	**1.37-2.2**
Nitrogen Total	mg/L	<0.002	<0.05	<0.002	<0.05	<0.002	<0.05	<0.002	<0.05	<0.002	<0.05	0.05	
Kjeldahl Nitrogen Total	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	
Phosphorus Total	mg/L	0.09				<0.05		<0.05		<0.05		0.05	
Phosphate as P	mg/L	<0.05		0.05		<0.05		<0.05		<0.05		0.05	
Metals Total (Trace)													
Aluminum Total	mg/L	**0.385**	**0.335**	0.054	**0.113**	**2.1**	**1.91**	**0.13**	0.046	0.046	<0.05	0.005	**0.005-0.1**
Antimony Total	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	0.0002	
Arsenic Total	mg/L	0.0004	0.0003	0.0003	<0.0002	0.0006	0.0005	0.0006	0.0004	0.0008	<0.002	0.0002	**0.005**
Barium Total	mg/L	0.029	0.028	0.008	0.009	0.029	0.029	0.037	0.041	0.03	0.037	0.001	
Beryllium Total	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.001	0.0001	
Bismuth Total	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	0.0005	
Boron Total	mg/L	0.007	0.004	<0.002	0.003	0.005	0.003	0.004	0.003	0.004	<0.02	0.002	
Cadmium Total	mg/L	**0.00022**	**0.00018**	**0.00003**	**0.00004**	**0.00118**	**0.00101**	**0.00003**	**0.00003**	<0.00001	<0.00010	0.00001	**0.000017**
Calcium Total	mg/L	17.2	19.5	6.2	6.5	<0.2	19.1	<0.2	26.1	13	16.6	0.2	
Chromium Total	mg/L	<0.0005	0.0011	<0.0005	<0.0005	0.0008	0.0041	0.0007	0.004	<0.0005	<0.005	0.0005	**0.02-0.002**
Cobalt Total	mg/L	0.0006	0.0006	<0.0001	0.0001	0.004	0.0039	0.0001	0.0001	<0.0001	<0.001	0.0001	
Copper Total	mg/L	**0.009**	**0.007**	<0.001	0.002	**0.046**	**0.04**	0.002	0.002	0.001	<0.01	0.001	**0.002-0.004**
Iron Total	mg/L	0.3	0.2	0.2	0.1	<0.1	**0.9**	<0.1	<0.1	<0.1	<0.1	0.1	**0.3**
Lead Total	mg/L	0.0001	0.0002	<0.0001	0.0001	0.0001	0.0002	0.0001	0.0005	<0.0001	<0.001	0.0001	**0.001-0.007**
Lithium Total	mg/L	0.002	0.001	0.005	0.002	0.004	0.003	0.002	<0.001	0.002	<0.01	0.001	
Magnesium Total	mg/L	2.9	2.9	0.9	0.8	<0.2	3.6	<0.2	3.1	1.7	1.8	0.2	
Manganese Total	mg/L	0.011	0.008	<0.005	<0.005	<0.005	0.043	<0.005	<0.005	<0.005	<0.005	0.005	
Mercury		<0.0002		0.0002		<0.0002		<0.0002		<0.0002		0.0002	
Molybdenum Total	mg/L	<0.001	<0.001	0.005	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	0.001	**0.073**
Nickel Total	mg/L	0.0015	0.0022	<0.0005	<0.0005	0.0069	0.0084	<0.0005	0.001	<0.0005	<0.005	0.0005	**0.025-0.15**
Potassium Total	mg/L	<0.4	0.9	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.4	
Selenium Total	mg/L	0.0004	0.0006	<0.0002	<0.0002	0.0004	0.0003	0.0003	0.0007	<0.0002	<0.002	0.0002	**0.001**
Silicon Total	mg/L	3	3.49	4.92	4.76	0.64	2.71	<0.05	2.85	2.54	2.33	0.05	
Silver Total	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0003**	<0.0001	**0.0003**	<0.0001	<0.001	0.0001	**0.0001**
Sodium Total	mg/L	0.9	1.6	1.5	1.7	<0.4	1	<0.4	1.2	0.4	0.9	0.4	
Strontium Total	mg/L	0.067	0.064	0.031	0.034	0.059	0.062	0.061	0.067	0.035	0.047	0.001	
Sulphur Total	mg/L	6.14	9.45	2.13	4.43	<0.05	15.4	<0.05	5.43	3.57	67.9	0.05	
Thallium Total	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	0.00005	**0.0008**
Tin Total	mg/L		<0.001		<0.001		<0.001		<0.001		<0.01	0.001	
Titanium Total	mg/L	0.002	0.0017	0.0021	0.0035	0.0014	0.001	0.004	0.002	0.0012	<0.005	0.0005	
Uranium Total	mg/L	<0.0005	<0.0005	0.0035	0.0025	0.0006	0.0006	<0.0005	<0.0005	<0.0005	<0.005	0.0005	
Vanadium Total	mg/L	0.0003	0.0003	0.0002	0.0003	0.0004	0.0004	0.0005	0.0003	0.0002	<0.001	0.0001	
Zinc Total	mg/L	0.013	0.011	<0.001	0.015	**0.057**	**0.049**	0.004	0.003	0.005	<0.01	0.001	**0.03**
Zirconium Total	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.01	0.001	
Physical and Aggregate Properties													
Solids Total Dissolved	mg/L	107		33		147		160		107		5	
Solids Total Suspended	mg/L	2		1		7		3		<1		1	
Temperature of observed pH and EC	°C	21	19.8	20.5	19.9	21	17.9	20.9	17.4	21	19	0.1	
Turbidity	NTU	2.5		0.6		5.5		1.5		0.5		0.1	
Routine Water													
Bicarbonate	mg/L	55	51	22	20	29	42	71	79	40	33	5	
Calcium Dissolved	mg/L	20.1	18.3	6.4	5.7	18.8	16.3	21.6	25.2	15.3	16.5	0.2	
Carbonate	mg/L	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	6	
Electrical Conductivity	uS/cm at 25C	129	121	50.1	41.6	137	141	127	141	90.9	98.7	1	
Hardness as CaCO3	mg/L	64	55.9	20	17.1	64.2	53.7	66.1	74.4	47.9	48.8	-	
Hydroxide	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	
Magnesium Dissolved	mg/L	3.4	2.5	1	0.7	4.2	3.1	3	2.8	2.4	1.7	0.2	
Nitrate - N	mg/L	<0.004	0.014	<0.004	0.005	<0.004	0.015	<0.004	0.033	<0.004	0.048	0.004	
Nitrite - N	mg/L		<0.002		<0.002		<0.002		<0.002		<0.002	0.002	**0.06**
P-Alkalinity as CaCO3	mg/L	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	
pH	pH units	7.62	7.76	7.29	7.24	7.22	7.6	7.65	7.87	7.48	7.79	0.01	**6.5-9.0**
Sulphate Dissolved	mg/L	18	22.4	7	6.7	42.3	44.6	9	16.3	9.9	11.9	0.02	
T-Alkalinity as CaCO3	mg/L	45	42	18	17	24	35	58	65	33	27	5	
Dissolved Oxygen	mg/L	5.8		5.7		5.7		5.6		5.7		0.1	
Manganese	mg/L	0.01		<0.005		0.046		<0.005		<0.005		0.005	
Nitrate and Nitrite	mg/L	<0.006		<0.006		<0.006		<0.006		<0.006		0.006	
Potassium	mg/L	0.5		0.5		<0.4		<0.4		<0.4		0.4	
Sodium	mg/L	1.1		3.6		1		0.8		1.4		0.4	

Note: *All samples analyzed at Norwest Labs (Surrey, BC). Empty cells represent analytes that were not sampled between the two sampling years.
- values in a yellow box exceed CCME guidelines for protection of aquatic life

Table 4. Surface Water Quality Results for 2005

Location ID:	TM-01	TM-02	TM-03	TM-04	TM-05	TM-06	TM-07	TM-08	TM-09	TM-10	TM-11	TM-12	TM-13	Detection Limit (ppm)	CCME Guidelines for Aquatic Life
Sampled By:	S. Keesey	S. Keesey	J. Taylor	J. Taylor	S. Keesey, J. Taylor	S. Keesey, J. Taylor	S. Keesey, J. Taylor	S. Keesey, J. Taylor	S. Keesey, J. Taylor	S. Keesey, J. Taylor	S. Keesey, J. Taylor	R. McIntyre, J. Taylor	S. Keesey		
Lab Lot #:	396433-1	396433-2	396641-1	396641-2	396996-1	396641-3	396641-4	396641-5	396641-6	396641-7	396433-8	396433-3	396433-4		
Date:	19-Jul-05	19-Jul-05	20-Jul-05	20-Jul-05	21-Jul-05	20-Jul-05	20-Jul-05	20-Jul-05	20-Jul-05	20-Jul-05	20-Jul-05	19-Jul-05	19-Jul-05		
Parameter															
Nutrients/ Cyanide/ DO (ppm)															
Ammonium - N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1.37-2.2
Kjeldahl Nitrogen	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	
Phosphorus	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.1	
Orthophosphate-P	0.04	0.03	0.03	0.04	0.1	0.04	0.03	0.04	0.02	0.02	0.01	0.03	0.03	0.01	
Cyanide	<0.024	<0.024	>0.0050	>0.0050	<0.02	>0.0050	>0.0050	>0.0050	0.0635	>0.0050	>0.0050	<0.024	0.201	0.002	
Dissolved Oxygen	22.2	10.7	17.3	18.8	-	29.2	30.5	25.5	20.3	18.0	22.2	30.2	25	0.1	
Dissolved Metals (ppm)															
Silicon	3.5	2.49	3.52	4.29	7.96	4.48	3.53	4.69	2.8	2.81	1.6	2.72	3.75	0.05	
Sulfur	3.2	4.8	0.8	5.4	16.1	3.6	8.6	2.4	15.7	5.6	6	13.7	3.2	0.3	
Mercury	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	
Aluminum	0.058	0.011	0.022	0.079	0.189	0.046	0.133	0.03	0.16	0.019	<0.005	<0.005	0.052	0.005	
Antimony	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	0.0002	
Arsenic	0.0003	0.0003	0.0003	0.0003	0.0009	0.0002	0.0002	<0.0002	0.0002	0.0005	0.0013	0.0005	0.0002	0.0002	
Barium	0.023	0.047	0.005	0.02	0.03	0.014	0.036	0.008	0.036	0.05	0.058	0.036	0.017	0.001	
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	
Bismuth	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	
Boron	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	
Cadmium	<0.00001	<0.00001	<0.00001	0.00002	0.00052	<0.00001	0.00018	<0.00001	0.00072	0.00001	<0.00001	0.00003	<0.00001	0.00001	
Chromium	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	
Cobalt	<0.0001	<0.0001	<0.0001	0.0001	0.0003	0.0001	0.0004	<0.0001	0.0037	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	
Copper	0.001	<0.001	<0.001	0.002	0.004	0.001	0.003	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	0.001	
Lead	0.0003	0.0003	0.0001	0.0003	0.0004	0.0003	<0.0001	0.0003	0.0004	<0.0001	<0.0001	0.0004	0.0003	0.0001	
Lithium	0.002	<0.001	0.002	0.002	0.003	0.002	0.001	0.002	0.003	<0.001	<0.001	<0.001	0.002	0.001	
Molybdenum	0.002	<0.001	0.001	0.003	<0.001	0.004	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	0.002	0.001	
Nickel	<0.0005	<0.0005	<0.0005	0.0006	0.0028	<0.0005	0.0014	<0.0005	0.0073	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	
Selenium	0.0002	0.0005	<0.0002	0.0002	0.0007	<0.0002	0.0007	<0.0002	0.0003	0.0009	<0.0002	0.002	0.0002	0.0002	
Silver	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	
Strontium	0.05	0.066	0.032	0.053	0.091	0.04	0.076	0.029	0.073	0.078	0.06	0.15	0.055	0.001	
Thallium	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
Titanium	0.001	0.0005	<0.0005	0.0007	0.0012	0.0007	0.0006	0.0008	0.0009	0.0009	<0.0005	0.0009	0.0011	0.0005	
Uranium	0.0018	<0.0005	0.0024	0.0018	<0.0005	0.0023	<0.0005	0.0026	<0.0005	<0.0005	<0.0005	0.0005	0.002	0.0005	
Vanadium	0.0002	0.0002	0.0002	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0004	0.0002	0.0001	0.0002	0.0001	
Zinc	<0.001	0.025	0.004	0.028	0.045	0.021	0.014	0.018	0.036	<0.001	0.002	0.002	0.02	0.001	
Subsample	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Total Metals (ppm)															
Calcium	11.7	23.1	4.7	14.6	22.7	9.7	23.5	6.2	24	29.4	21.5	40.6	12.3	0.2	
Iron	<0.1	<0.1	<0.1	0.2	<0.1	0.1	0.2	<0.1	**1.5**	0.1	<0.1	<0.1	<0.1	0.1	0.3
Magnesium	2.2	4.6	0.7	2.6	5.5	1.5	3.9	0.9	5	4.1	2.6	7.6	2.6	0.1	
Manganese	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	0.008	<0.005	0.051	0.007	<0.005	0.008	<0.005	0.005	
Potassium	0.5	<0.4	0.8	1	0.7	0.9	0.8	0.9	0.4	<0.4	<0.4	<0.4	0.5	0.4	
Silicon	3.09	2.42	3.41	4.14	7.47	4.28	3.41	4.45	3.22	2.86	1.52	2.59	3.51	0.05	
Sodium	1.2	1	1.6	1.6	2.3	1.6	1.3	1.6	1.2	1	0.7	1.1	1.3	0.4	
Sulfur	2.8	4.5	0.8	5.7	14.2	3.8	8.6	2.5	16.7	6.1	6.2	12.7	2.7	0.3	
Mercury	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	
Aluminum	0.059	0.015	0.059	**0.133**	**0.219**	0.096	**0.262**	0.055	**2.08**	0.066	0.008	0.007	0.055	0.005	0.005-0.1
Antimony	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	
Arsenic	0.0004	0.0004	0.0004	0.0003	0.0009	0.0003	0.0002	<0.0002	0.0007	0.0004	0.0014	0.0006	0.0004	0.0002	0.005
Barium	0.021	0.047	0.005	0.021	0.028	0.014	0.037	0.008	0.04	0.052	0.06	0.036	0.016	0.001	
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	
Bismuth	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	
Boron	0.003	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	
Cadmium	<0.00001	<0.00001	<0.00001	**0.00009**	**0.00047**	**0.00007**	**0.0002**	**0.00003**	**0.0014**	0.00001	<0.00001	**0.00004**	<0.00001	0.00001	0.000017
Chromium	<0.0005	0.0014	<0.0005	0.0022	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	
Cobalt	<0.0001	<0.0001	<0.0001	0.0002	0.0003	0.0001	0.0005	<0.0001	0.0042	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	
Copper	0.001	<0.001	<0.001	0.003	**0.005**	0.002	**0.006**	<0.001	**0.047**	<0.001	<0.001	<0.001	0.001	0.001	0.002-0.004
Lead	0.0003	0.0003	0.0002	0.0003	0.0006	0.0003	0.0003	0.0005	0.0004	<0.0001	0.0003	0.0004	0.0003	0.0001	0.001-0.007
Lithium	0.002	<0.001	0.003	0.002	0.003	0.002	0.001	0.002	0.003	<0.001	<0.001	<0.001	0.002	0.001	
Molybdenum	0.001	<0.001	0.001	0.003	<0.001	0.004	<0.001	0.005	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.073
Nickel	<0.0005	<0.0005	<0.0005	0.0008	0.0026	0.0006	0.0016	<0.0005	0.0085	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.025-0.15
Selenium	0.0004	0.0007	<0.0002	0.0003	0.0007	<0.0002	0.0008	<0.0002	0.0003	0.0009	<0.0002	**0.0019**	<0.0002	0.0002	0.001
Silver	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001
Strontium	0.048	0.066	0.032	0.054	0.1	0.04	0.076	0.029	0.075	0.082	0.06	0.157	0.055	0.001	
Thallium	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
Titanium	0.0014	0.0006	0.0028	0.0021	0.0016	0.0027	0.0008	0.0028	0.0009	0.0022	<0.0005	0.0008	0.0012	0.0005	
Uranium	0.0018	<0.0005	0.0027	0.002	<0.0005	0.0023	0.0005	0.0027	0.0007	<0.0005	<0.0005	0.0006	0.0022	0.0005	
Vanadium	0.0002	0.0004	0.0002	0.0002	0.0001	0.0003	0.0003	0.0003	0.0006	0.0004	0.0002	<0.0001	0.0002	0.0001	
Zinc	0.013	0.024	0.016	0.026	**0.05**	0.02	0.024	0.018	**0.06**	<0.001	0.024	0.002	0.019	0.001	0.03
Zirconium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	
Physical															
Total DissolvedSolids (mg/L dried)	53	87	33	47	120	53	120	33	87	93	60	127	47	7*	
Turbidity (NTU)	0.3	0.3	0.5	0.7	1.5	0.9	0.8	1.4	5	1.4	0.1	0.3	0.4	0.1*	
Temperature of observed pH (°C)	21.1	20.9	20.4	20.4	20	20.1	19.9	20.4	20.4	20.8	20.6	20.7	20.6		
Total Suspended Solids (mg/L)	<1	<1	<1	<1	6	<1	<1	6	4	3	<1	<1	1	1*	
pH	7.95	8.16	7.59	7.82	7.89	7.65	8.02	7.48	7.76	8.13	7.98	8.06	7.97		6.5-9.0
Electrical Conductivity (uS/cm)	92	158	33	95	188	66	143	46	158	163	123	259	92	1*	
Routine (mg/L)															
Calcium	12.5	24.4	4.8	15	24.2	10.2	24.1	6.4	24.1	29.8	22.3	41	12.7	0.2	
Magnesium	2.4	4.8	0.6	2.6	5.8	1.5	3.9	0.9	4.9	4	2.6	7.6	2.7	0.1	
Sodium	1.1	0.8	1.2	1.4	2.3	1.3	1.1	1.4	1	0.8	0.5	0.9	1.2	0.4	
Potassium	<0.4	<0.4	<0.4	<0.4	0.6	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.4	
Iron	0.05	0.02	<0.01	0.04	0.05	0.03	0.04	0.04	<0.01	0.03	<0.01	0.09	0.05	0.01	
Manganese	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	0.005	<0.005	0.049	<0.005	<0.005	0.007	<0.005	0.005	
Nitrate - N	0.02	0.01	0.01	0.02	0.01	0.02	0.03	0.01	0.02	0.03	0.04	0.02	0.01	0.01	0.06
Nitrite - N	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	
Nitrate and Nitrite - N	0.02	<0.02	<0.02	0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.03	0.04	0.02	<0.02	0.02	
Sulfate (SO4)	9.6	14	2	16	48.3	11	26	7.3	47.2	17	18	41	9.6	0.9	
Hydroxide	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	
Carbonate	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	6	
Bicarbonate	44	86	23	41	59	33	65	24	43	95	57	118	50	5	
P-Alkalinity	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	
T-Alkalinity	36	71	19	34	48	27	53	19	35	78	47	96	41	5	
Hardness	41.1	81	15	48	84	31.6	76	20	80	91	66	134	43		

*** units are given in parameters column**
- values in a yellow box exceed CCME guidelines

Stream Sediment Quality

The results of the stream sediment analysis (conducted in October 2002 and July 2005) are summarized in Table 5. The results have been compared to the Canadian Environmental Quality Guidelines for Sediments, and the original laboratory results from Norwest Labs are available on CD.

The sediment quality data for 2002 and 2005 indicates that several metals were found in moderately elevated concentrations. These metals include arsenic, cadmium, chromium, copper, lead, and zinc. There was no significant variation in concentrations between 2002 and 2005. A summary of pertinent results is noted below:

- Elevated arsenic is found in the highest concentrations in Chalco Creek (TM-09 and TM-11) and upstream in Slate Creek (TM-12);
- Elevated cadmium is found in the highest concentrations in Chalco Creek (TM-09), Silco Creek (TM-05) and Slate Creek (TM-12);
- Elevated chromium is found in the highest concentrations in Slate Creek (TM-02) and Chalco Creek (TM-09 and TM-11);
- Elevated copper is found in the highest concentrations in Chalco Creek (TM-09);
- Elevated lead is found in the highest concentrations in Chalco Creek (TM-09); and
- Elevated zinc is found in the highest concentrations in Chalco Creek (TM-09), Silco Creek (TM-05) and Slate Creek (TM-12).

Table 5. Stream Sediment Results for 2002 and 2005

Location ID:	TM-01 (a)	TM-01 (b)	TM-01 Sample 1	TM-01 Sample 2	TM-01 Sample 3	TM-02 (a)	TM-02 (b)	TM-02 Sample 1	TM-02 Sample 2	TM-02 Sample 3	TM-03 (a)	TM-03 (b)	TM-03 Sample 1	TM-03 Sample 2	TM-03 Sample 3	TM-04 (a)	TM-04 (b)	TM-04 Sample 1	TM-04 Sample 2	TM-04 Sample 3	Detection Limit (ppm)	CCME	
Sampled By:	T. Ritchie		S. Keesey			T. Ritchie		S. Keesey			T. Ritchie		J. Taylor			T. Ritchie		J. Taylor				Interim Sediment Quality Guideline	Probable Effect level
Lab Lot #:	200789-1	200789-1	396966-2	396966-3	396966-4	200789-2	200789-2	396966-5	396966-6	396966-7	201780-1	201780-1	396966-8	396966-9	396966-10	201780-2	201780-2	396966-11	396966-12	396966-13			
Date:	21-Oct-02	21-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05	21-Oct-02	21-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05	23-Oct-02	23-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05	23-Oct-02	23-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05			
Parameter																							
Metals - Strong Acid Digestion (ug/g)																							
Mercury	<0.01	<0.01	0.02	0.01	0.02	<0.01	<0.01	0.02	0.02	0.02	<0.01	<0.01	<0.01	0.01	0.01	0.024	0.012	0.02	0.02	0.02	0.01	0.17	0.486
Antimony	0.6	0.7	<0.2	<0.2	<0.2	0.9	0.4	<0.2	<0.2	<0.2	<0.3	<0.3	<0.2	<0.2	<0.2	1	0.8	<0.2	<0.2	<0.2	0.5		
Arsenic	8.36	12.2	9.7	6.6	6.8	14.3	12.7	19.3	17	15.4	2.4	3.3	2.6	2	2	12	9.53	7.2	6.8	6.5	0.5	5.9	17
Barium	54	76.9	113	56	68	135	55.1	92	72	66	25	19.9	29	21	37	169	107	82	83	94	0.02		
Beryllium	0.32	0.4	1	0.6	0.7	0.11	0.11	0.2	0.1	0.1	0.32	0.38	0.6	0.4	0.5	1.04	0.79	0.8	0.9	1.1	0.05		
Cadmium	0.91	1.14	1.36	0.8	0.76	1.18	0.9	1.16	0.82	0.98	0.04	0.06	0.07	0.05	0.06	4.67	2.81	2.09	1.65	1.52	0.05	0.6	3.5
Chromium	16.1	23.1	25.3	16.7	17	49.7	48.2	40.3	41.7	52.4	7.47	3.54	4.1	2.8	2.9	29.4	22.1	16.9	17.6	18.7	0.08	37.3	90
Cobalt	6.01	7.66	10.9	7.2	7.6	10.3	9.17	12.2	14.8	14.1	1.37	1.12	2.3	1.5	1.8	20.2	13.2	10.1	10.2	9.7	0.07		
Copper	21	25.4	32	18	18	31.4	25.3	32	31	33	1.76	2.76	3	2	2	95.6	56.6	48	41	32	0.1	35.7	197
Lead	6.81	8.69	11.7	8.1	7.8	8.02	8.21	11.4	8.9	8.4	1.76	1.82	2.5	1.8	2.3	13.7	10.4	9.2	12.9	16.5	0.2	35	91.3
Molybdenum	1.72	1.87	3	2	2	1.8	2.18	2	2	2	0.5	0.38	<1	<1	<1	4.07	3.3	3	5	7	0.1		
Nickel	17.6	22.7	22	17.1	15.4	38.3	31.4	36.6	35.1	39.4	4.88	2.57	3.6	2.4	2.3	36.3	26	25.8	18.5	17.5	0.1		
Selenium	1.6	1.3	<0.3	0.4	<0.3	2.5	2.2	1.3	1.1	0.9	1.3	0.5	<0.3	<0.3	<0.3	2	1.2	0.3	<0.3	0.3	0.4		
Silver	<0.05	<0.05	0.2	<0.1	<0.1	0.06	0.08	0.2	0.2	0.2	<0.05	<0.05	<0.1	<0.1	<0.1	<0.05	<0.05	0.1	0.1	0.2	0.1		
Thallium	<0.2	<0.2	0.26	0.17	0.21	<0.2	<0.2	0.06	<0.05	<0.05	<0.2	<0.2	0.19	0.17	0.17	<0.2	<0.2	0.18	0.23	0.27	0.4		
Tin	2	1.7	2	2	2	1.6	1.5	1	2	2	2.5	2.2	2	2	2	2.1	1.9	2	2	2	0.3		
Vanadium	21.2	27.4	34.2	23.4	24.6	36	34.1	37.6	36.1	40.5	7.6	7.51	11.4	7.9	9.6	41.3	32.9	26.9	29.6	32.9	0.05		
Zinc	82.7	100	123	90	91	99.4	99.1	140	97	120	21.6	20.3	30	23	27	249	172	170	132	120	0.06	123	315
Total Organic Carbon (%)	0.51	1	1.33	0.35	0.39	0.48	0.32	0.66	0.15	0.14	0.08	0.2	0.22	0.08	0.14	1.95	1.3	0.89	3	0.67			
Total Inorganic Carbon (%)	-	-	0.06	0.07	0.06	-	-	0.17	0.11	0.2	-	-	<0.05	<0.05	<0.05	-	-	<0.05	0.05	<0.05			
Water Soluble Boron (mg/kg)	-	-	0.2	<0.1	<0.1	-	-	0.2	<0.1	<0.1	-	-	<0.1	<0.1	<0.06	-	-	0.2	0.2	0.1			

Location ID:	TM-05 (a)	TM-05 (b)	TM-05 Sample 1	TM-05 Sample 2	TM-05 Sample 3	TM-06 (a)	TM-06 (b)	TM-06 Sample 1	TM-06 Sample 2	TM-06 Sample 3	TM-07 (a)	TM-07 (b)	TM-07 Sample 1	TM-07 Sample 2	TM-07 Sample 3	TM-08 (a)	TM-08 (b)	TM-08 Sample 1	TM-08 Sample 2	TM-08 Sample 3	Detection Limit (ppm)	CCME	
Sampled By:	T. Ritchie		S. Keesey, J. Taylor			T. Ritchie		S. Keesey, J. Taylor			T. Ritchie		S. Keesey, J. Taylor			T. Ritchie		S. Keesey, J. Taylor				Interim Sediment Quality Guideline	Probable Effect level
Lab Lot #:	201780-5	201780-5	396966-14	396966-15	396966-16	201154-1	201154-1	396966-17	396966-18	396966-19	201154-2	201154-2	396966-20	396966-21	396966-22	200789-3	200789-3	396966-23	396966-24	396966-25			
Date:	23-Oct-02	23-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05	22-Oct-02	22-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05	22-Oct-02	22-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05	21-Oct-02	21-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05			
Parameter																							
Metals - Strong Acid Digestion (ug/g)																							
Mercury	<0.01	<0.01	0.01	0.01	0.02	<0.01	<0.01	0.01	0.01	0.01	<0.01	<0.01	0.01	0.02	0.02	<0.01	<0.01	0.01	0.02	0.01	0.01	0.17	0.486
Antimony	1.5	0.9	0.3	0.3	0.2	0.4	0.3	<0.2	<0.2	<0.2	0.8	1	0.3	<0.2	<0.2	<0.3	0.3	<0.2	<0.2	<0.2	0.5		
Arsenic	24.5	22.9	31.4	27.2	51.3	5.09	5.83	3.7	3.2	3.6	11.1	7.84	11.8	12.4	14.8	8.38	3.3	3	3	4.5	0.5	5.9	17
Barium	126	94.9	126	108	190	66.7	58.7	35	50	39	95	71.3	81	68	87	44.9	35.4	54	55	82	0.02		
Beryllium	0.41	0.4	0.7	0.6	1.3	0.35	0.36	0.5	0.6	0.6	0.38	0.29	0.4	0.4	0.5	0.35	0.38	0.8	0.8	1.2	0.05		
Cadmium	8.86	7.51	10.3	9.57	12.5	1.29	1.14	0.39	0.76	1.12	2.93	1.82	3.36	3.04	3.12	1.06	0.46	0.54	0.58	0.8	0.05	0.6	3.5
Chromium	45.4	27.1	34.8	36	36.8	14.1	15.9	5.6	10	10.4	27.8	33.7	32.2	39	35.8	14.4	13.6	9.4	9.3	15.2	0.08	37.3	90
Cobalt	24.7	20.6	34	33.5	39.8	8.34	6.47	3.2	4.7	4.5	16.9	13.6	25.4	26.1	23.4	2.6	2.4	4.6	4.4	7.3	0.07		
Copper	35.1	35.5	51	46	94	21	23	6	11	9	60.7	39.9	54	53	58	6.03	5.52	11	10	21	0.1	35.7	197
Lead	11.8	15.4	25.9	17.3	48.6	6.1	5.49	5.8	15.4	7.1	9.04	8.31	13	9.2	13	9.13	24.6	8.8	9.6	18.6	0.2	35	91.3
Molybdenum	5.29	7.31	12	12	14	2.08	1.78	3	6	2	2.22	2.06	4	3	3	1.61	2.49	6	5	11	0.1		
Nickel	47.2	41.5	56.8	58.6	75.3	14.9	15.6	5.1	9.5	9.4	39.4	33.8	44.5	47.3	46.4	9.82	8.81	7.9	8.8	13.3	0.1		
Selenium	2.2	1.4	<0.3	<0.3	0.8	1.5	1.1	<0.3	<0.3	0.3	1.7	1	0.9	0.5	0.5	<0.2	0.6	<0.3	<0.3	<0.3	0.4		
Silver	<0.05	0.09	0.2	0.1	0.5	<0.05	<0.05	<0.1	<0.1	<0.1	<0.05	<0.05	0.2	0.2	0.2	<0.05	<0.05	<0.1	<0.1	0.1	0.1		
Thallium	<0.2	<0.2	0.13	0.12	0.22	<0.2	<0.2	0.17	0.19	0.24	<0.2	<0.2	0.09	0.1	0.11	<0.2	<0.2	0.24	0.22	0.32	0.4		
Tin	1.4	1.4	2	1	2	2.1	1.8	3	3	4	1.2	1.4	2	2	2	3	2.3	2	2	2	0.3		
Vanadium	34.6	22.6	30.4	29.8	38.7	20.8	20.6	13.5	24.3	23.7	30.7	31.7	34.9	37.6	38	23.1	15.8	21.2	22.7	31.7	0.05		
Zinc	293	289	470	428	754	71.6	79.1	38	59	48	186	125	234	214	220	32.2	31.3	58	58	82	0.06	123	315
Total Organic Carbon (%)	0.35	0.31	0.43	0.5	0.9	0.75	0.57	0.12	0.38	0.06	0.66	0.52	0.14	0.11	0.19	0.12	0.33	0.22	0.23	0.33			
Total Inorganic Carbon (%)	-	-	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	-	0.1	0.19	0.15	-	-	<0.05	<0.05	<0.05			
Water Soluble Boron (mg/kg)	-	-	<0.1	<0.1	0.1	-	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1			

Location ID:	TM-09 (a)	TM-09 (b)	TM-09 Sample 1	TM-09 Sample 2	TM-09 Sample 3	TM-10 (a)	TM-10 (b)	TM-10 Sample 1	TM-10 Sample 2	TM-10 Sample 3	TM-11 (a)	TM-11 (b)	TM-11 Sample 1	TM-11 Sample 2	TM-11 Sample 3	TM-12 Sample 1	TM-12 Sample 2	TM-12 Sample 3	TM-13 Sample 1	TM-13 Sample 2	TM-13 Sample 3	Detection Limit (ppm)	CCME	
Sampled By:	T. Ritchie		S. Keesey, J. Taylor			T. Ritchie		S. Keesey, J. Taylor			T. Ritchie		S. Keesey, J. Taylor			R. McIntyre, J. Taylor			S. Keesey				Interim Sediment Quality Guideline	Probable Effect level
Lab Lot #:	201154-3	201154-3	396966-26	396966-27	396966-28	201154-4	201154-4	396966-29	396966-30	396966-31	201154-5	201154-5	396966-32	396966-33	396966-34	396966-35	396966-36	396966-37	396966-38	396966-39	396966-40			
Date:	22-Oct-02	22-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05	22-Oct-02	22-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05	22-Oct-02	22-Oct-02	21-Jul-05	21-Jul-05	21-Jul-05	21-Jul-05	21-Jul-05	21-Jul-05	21-Jul-05	21-Jul-05	21-Jul-05			
Parameter																								
Metals - Strong Acid Digestion (ug/g)																								
Mercury	0.022	0.015	0.02	0.02	0.01	0.022	<0.01	0.02	0.02	0.02	<0.01	<0.01	0.02	0.03	0.02	0.04	0.02	0.02	0.02	0.01	0.01	0.01	0.17	0.486
Antimony	2	2.6	<0.2	<0.2	<0.2	0.8	0.6	<0.2	<0.2	<0.2	<0.3	<0.2	<0.2	<0.2	<0.2	4.1	0.8	0.4	<0.2	<0.2	<0.2	0.5		
Arsenic	73.5	37.4	51.6	62.1	115	13.9	9.54	21.9	33.1	30.9	29.3	39.9	34	143	63.5	64.2	60.4	46.8	6.6	6	4.1	0.5	5.9	17
Barium	177	173	175	192	188	101	61.1	84	88	86	89.8	120	76	153	154	241	277	224	64	36	78	0.02		
Beryllium	2.33	2.01	2.7	2.8	2.2	0.15	0.08	0.2	0.2	0.1	0.06	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.6	0.3	0.3	0.05		
Cadmium	18.9	14.1	12.9	14.3	17.6	1.22	1.13	1.52	1.41	1.48	0.29	0.34	0.19	0.36	0.29	5.51	6.96	5.43	0.81	0.59	0.75	0.05	0.6	3.5
Chromium	43	40.5	49.2	44.7	58.8	50.2	55.7	35.2	25.2	25.8	138	110	99.5	100	111	31.5	36.1	21.5	19.1	16.9	18.2	0.08	37.3	90
Cobalt	93.3	68.2	90.2	94.7	160	9.9	9.26	11	9.8	9.6	13.1	13	16.4	16.1	17.8	13.4	17.8	13.2	7.8	5.8	5.8	0.07		
Copper	657	539	474	590	497	37.4	29.3	41	39	37	24.8	28.1	30	34	36	51	48	38	23	13	13	0.1	35.7	197
Lead	76.1	51.3	73.4	56.4	52.1	5.55	4.77	6.1	9.8	6.3	1.69	2.69	2.7	3.7	3.6	25.8	17.4	12.6	8.3	6.4	5.5	0.2	35	91.3
Molybdenum	14	13.6	15	15	13	2.58	2.6	3	4	3	0.7	0.65	<1	1	<1	40	12	8	2	1	1	0.1		
Nickel	135	91.8	115	116	156	33.8	34.7	35.4	32.4	31.3	49	48.1	47.2	44.4	48.4	70.4	85.7	56.9	19	16.6	17.6	0.1		
Selenium	3.5	3.9	<0.3	<0.3	0.3	2.5	2.8	1.2	0.9	0.9	1.2	2	<0.3	2.4	0.9	4.6	4.7	2.9	0.4	<0.3	<0.3	0.4		
Silver	0.1	0.06	0.5	0.5	0.7	0.09	0.07	0.2	0.2	0.2	<0.05	<0.05	<0.1	0.1	0.1	0.7	0.4	0.3	0.1	<0.1	0.1	0.1		
Thallium	0.8	0.3	0.18	0.19	0.19	<0.2	<0.2	0.06	0.07	0.06	<0.2	<0.2	<0.05	0.07	0.07	0.17	0.16	0.12	0.22	0.11	0.11	0.4		
Tin	1.1	1.2	2	2	2	1.5	1.6	2	2	2	1.1	1.4	2	2	2	2	2	2	3	3	3	0.3		
Vanadium	37.6	35	41	41.2	41.9	47.2	41	48.2	40.7	39.6	40.8	41.1	45.7	54	52.5	70.1	55.5	40	27.5	22.1	20.4	0.05		
Zinc	922	590	671	732	774	130	115	175	175	173	41.7	46.2	36	57	50	565	545	445	95	62	64	0.06	123	315
Total Organic Carbon (%)	1.93	1.51	0.52	0.57	0.95	1.26	0.3	0.6	0.21	0.22	1.91	1.68	1.19	3.59	2.76	0.76	1.18	0.89	0.85	0.11	0.26			
Total Inorganic Carbon (%)	-	-	<0.05	<0.05	<0.05	-	-	0.27	0.31	0.32	-	-	<0.05	0.06	<0.05	0.68	0.69	0.74	0.07	0.05	0.11			
Water Soluble Boron (mg/kg)	-	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	-	-	0.2	0.2	0.2	<0.1	0.1	<0.1	<0.1	<0.1	<0.1			

- values in a yellow box exceed CCME gludelines

- values in a red box exceed 'probable effect level'

Hydrology

Flow discharge rates calculated at the monitoring sites are summarized below in Table 6 below. Raw flow data for each station is included in Appendix B, and for photographs of the various monitoring sites, refer to Appendix C.

Table 6. Summary of Discharge Rates at Environmental Monitoring Sites in 2002 and 2005.

	Discharge (m^3/sec)		
Station	**Oct-02**	**Jul-05**	**Notes**
TM-01*	-	-	Flow not measured – too high
TM-02	*0.65*	*0.76*	
TM-03	*3.58*	*4.38*	
TM-04	-	*3.40*	Not measured in 2002 – too high
TM-05	*0.12*	*0.08*	
TM-06	*3.32*	*3.38*	
TM-07	*2.00*	*1.36*	
TM-08	*3.85*	*1.84*	
TM-09	*0.32*	*0.25*	
TM-10	*0.88*	*0.51*	
TM-11	*0.35*	*0.09*	
TM-12	-	*0.01*	Site not established in 2002
TM-13	-	*10.77*	Site not established in 2002

***data logger and staff gauge installed in July 2005**

With the exception of site TM-08, the measured discharge rates at the two sampling events did not vary significantly for given sites. The 2002 reading for the TM-08 location does not correspond with the expected value at this site given the cumulative discharge measurements downstream. This reading is considered inaccurate.

The two data collection events were conducted during low-medium flow periods. Further measurements in spring 2006 will provide instantaneous readings during medium-high flows in the various study area watercourses. Datalogging instrumentation will return a continuous discharge record in the Boswell River (TM-01) below all contributing influences in the projected project area.

For Fishery study information, please see Appendix D.
For Wildlife study information, please see Appendix E.
For Heritage and Archaeology study information, Please see Appendix F.

CONCLUSION

Baseline environmental studies have been initiated to support development as the project advances. These studies provide preliminary information on local environmental conditions with the project area and will be used to support the regulatory assessment and permit application review processes that are being engaged for the project to proceed. Ongoing and recently initiated studies include:

- Continuing water quality monitoring at some or all of the previously established monitoring stations (September 2005);
- Fisheries surveys (July and September 2005);
- Wildlife habitat usage and local wildlife population assessments (October 2005);
- Climate and meteorological data gathering and assessment, and;
- Preliminary socio-economic, archaeological and cultural element assessments within the project area.

REFERENCES

Environment Canada, 2001a. *Guidance Document for the Sampling and Analysis of Metal Mining Effluents.* EPS 2/MM/5. Minerals and Metals Division, Environmental Protection. Minister of Public Works and Government Services, Canada.

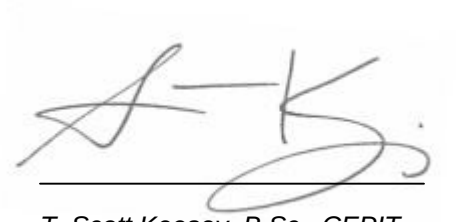
Environment Canada, 2001b. *Guidance Document for Flow Measurement of Metal Mining Effluents.* EPS 2/MM/4. Minerals and Metals Division, Environmental Protection. Minister of Public Works and Government Services, Canada.

Canadian Council of Ministers of the Environment (CCME), 2001. Canadian environmental quality guidelines. Canadian Council of Ministers of the Environment, Winnipeg.

CLOSURE

ACG trusts that this summary report will meet your needs at this time and supports the company's efforts to further examine the Red Mountain Property. Should you have any questions, please contact the undersigned at (867) 668-6463.

Prepared by:



T. Scott Keesey, B.Sc., CEPIT
Environmental Scientist

Reviewed by:

Dan Cornett, P.Biol, CCEP
Senior Scientific Review

Appendices

Red Mountain, Yukon, Canada

Baseline Biophysical Study
Results Summary Report for
2002-2005 Data Collection Exercises

Appendix A

Streamside Checklists

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre - 151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6580
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1)	Project	TML-02-01	2)	Location	TML-01
3)	Watershed	Boswell River	4)	Date	Oct-21/02
5)	Stream	Boswell River	6)	Reach	D/S Slate Creek
7)	Length surveyed (m)	100m	8)	Crew	T.Ritchie
9)	Community Watershed	Y (N)			
10)	Wet. Width (m)	12	11)	Channel width (m)	13
12)	Riffle depth (m)	0.4	13)	Max. Depth (m)	0.8
14)	Gradient %	<5%	15)	Flow Type	(P) I E
16)	Present Flow	None L (M) H			
17)	Avg. Bank Ht. (m)		18)	Ground Conditions	D M W
19)	Floodplain Width (m) (facing upstream)	Left		Right	

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		60%	30%	10%	<1	<1
Bank %						

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	Y	(N)	Eroding Banks	Y	(N)
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %	70%	50		70	50	
Distance (m)	1	1.5		1	1.5	

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	(N)	Pistol butt/jackstraw	Y	(N)
Disturbed Soils	(Y)	N	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H		
Size Present	F	(S)	M	L	
Debris Jams	(S)	M	L	None	
Sediment Wedges	G	C	B		
Debris Transport Potential	L	(M)	H	(see WTP on Gully Card)	
Largest Debris Size Moving	F	S	(M)	L	

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / (M)-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	WS, Ash, Willow	# Leaners (per 30m)	
Deciduous Tree %		Ground Cover %	100
Ground Species		Canopy Cover%	<10

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6580
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount (None) L M H

Old/New _____ Species _____

Orientation _____

Wet Ground	Y	N	Suspended Windfall	Y N
Shallow Root	Y	N	Instream Windfall	Y N

28) Stream Classification: S2(Si)

Basis of Evaluation (M G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) N/A

Mgmt. Zone (m) N/A

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
(S2)	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier N/A

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling N/A Fish Observed Y N

Site #	T (c°)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See data tables

Water Sample Parameters: See data tables

Temp (°C): 3.6°C Cond.: 100 µS/cm pH: 6.9 Turbidity: L

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: 'muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TML-02-01
2) Location: TML-02
3) Watershed: Bostwell River
4) Date: Oct. 21/02
5) Stream: Slate Creek
6) Reach: Lowest
7) Length surveyed (m): 50m
8) Crew: T. RITCHIE
9) Community Watershed: Y (N)
10) Wet. Width (m): 2.5
11) Channel width (m): 3.5
12) Riffle depth (m): 0.3
13) Max. Depth (m): 0.5
14) Gradient %: ≈5%
15) Flow Type: (P) I E
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m): 1.5
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left — Right —

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		<5	50	40	~5	
Bank %				30	60	<10

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	(Y)	N	Eroding Banks	Y	(N)
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %	80	30				
Distance (m)	1.5	1.0				

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	(N)	Pistol butt/jackstraw	Y	(N)
Disturbed Soils	Y	(N)	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H	
Size Present	F	(S)	M	L
Debris Jams	S	M	L	(None)
Sediment Wedges	G	C	B	
Debris Transport Potential	L	(M)	H	(see WTP on Gully Card)
Largest Debris Size Moving	F	(S)	M	L

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / (C)-Coniferous Forest

Tree Species: WS, Willow, Ash
Leaners (per 30m):
Deciduous Tree %: 10%
Ground Cover %: 100%
Ground Species:
Canopy Cover%: 60%

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount (None) L M H

Old/New _____ Species _____

Orientation _____

Wet Ground Y N Suspended Windfall Y N

Shallow Root Y N Instream Windfall Y N

28) Stream Classification: S3

Basis of Evaluation (W) G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) N/A

Mgmt. Zone (m) N/A

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier N/A

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See data tables

Water Sample Parameters: " " "

Temp (°C): 3.1 Cond.: 130 pH: 7.1 Turbidity: L

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: 'muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TML-02-01
2) Location: TML-03
3) Watershed: Boswell River
4) Date: Sept. 22/02
5) Stream: Unnamed Creek
6) Reach: Lowest
7) Length surveyed (m): 100m
8) Crew: T. RITCHIE
9) Community Watershed: Y (N)
10) Wet. Width (m): 12m
11) Channel width (m): 13
12) Riffle depth (m): 0.4
13) Max. Depth (m): 0.7
14) Gradient %: 5%
15) Flow Type: (P) I E
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m): 1.0
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left — Right —

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %	—	65	30	<5	<5	<1
Bank %	—	—	—	30	60	<10

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	Y	(N)	Eroding Banks	Y	(N)
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %	80	5	—	80	5	—
Distance (m)	1	50+	—	1	50+	—

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	(N)	Pistol butt/jackstraw	Y	(N)
Disturbed Soils	Y	(N)	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H	
Size Present	F	S	(M)	L
Debris Jams	S	M	L	(None)
Sediment Wedges	G	C	B	
Debris Transport Potential	L	M	(H)	(see WTP on Gully Card)
Largest Debris Size Moving	F	S	(M)	L

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species: W.S. Pine, Willow, Ash
Leaners (per 30m): 5
Deciduous Tree %: 15%
Ground Cover %: 100%
Ground Species: —
Canopy Cover%: 15%

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services
ACCESS CONSULTING GROUP
#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount: None (L) M H
Old/New: Old
Species: W.S,
Orientation: into creek
Wet Ground: (Y) N
Suspended Windfall: Y (N)
Shallow Root: (Y) N
Instream Windfall: (Y) N

28) Stream Classification: S2
Basis of Evaluation (W) G F)
Operational Prescriptions:
RMA Width:
Reserve Zone (m) N/A
Mgmt. Zone (m) N/A

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier N/A - None
Type: falls cascade culvert beaverdam logjam other
Height (m) _____ Gradient % _____ Length (m) _____
Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab
Soil Sample Parameters: See data tables
Water Sample Parameters: " "

Temp (°C): 3.0 Cond.: _____ pH: _____ Turbidity: C

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: `muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TML-02-01
2) Location: TML-04
3) Watershed: Boswell River
4) Date: Oct. 22/04
5) Stream: Boswell River
6) Reach: Instrup
7) Length surveyed (m): 100
8) Crew: T. RITCHIE
9) Community Watershed: Y (N)
10) Wet. Width (m): 20 m
11) Channel width (m): 20
12) Riffle depth (m): 0.5
13) Max. Depth (m): 2.0
14) Gradient %: <5%
15) Flow Type: (P) I E
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m): 1.5
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left — Right 10 m

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		<1	10	35	50	<5
Bank %	—	—	5	25	65	<5

21) Channel Characteristics

Stable	Y	(N)	Old Stream Channels	(Y)	N
Undercut Banks	(Y)	N	Eroding Banks	(Y)	N
Flood Channels	(Y)	N →	How Many?	1	

22) Sidewalls

	Left			Right		
Slope %	100	~~45~~		100	20	
Distance (m)	1.5			.5	10	

24) Slope Stability (slopes <3m. high only)

Evident Slumps	(Y)	N	Pistol butt/jackstraw	(Y)	N
Disturbed Soils	(Y)	N	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	L	(M)	H		
Size Present	F	S	~~M~~	(L)	
Debris Jams	S	(M)	L	None	
Sediment Wedges	(G)	C	B		
Debris Transport Potential	L	M	(H)	(see WTP on Gully Card)	
Largest Debris Size Moving	F	S	(M)	L	

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	WS, Pine, Willow, Ash	# Leaners (per 30m)	~~5~~
Deciduous Tree %	40	Ground Cover %	100
Ground Species		Canopy Cover%	<10

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount: None (L) M H

Old/New: Old

Species: Willow Ash

Orientation: in and out stream

Wet Ground: Y (N)

Suspended Windfall: (Y) N

Shallow Root: (Y) N

Instream Windfall: (Y) N

28) Stream Classification: S1

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) ✓

Mgmt. Zone (m) ✓

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier N/A

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See Data Sheets

Water Sample Parameters:

Temp (°C): 3.6 Cond.: _____ pH: _____ Turbidity: M

Turbidity:

(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;

(M) - Moderately Turbid: 'muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;

(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);

(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TML-02-01
2) Location: TML-05
3) Watershed: Bosswell River
4) Date: ~~Sept~~ Oct. 22/02
5) Stream: Silco Creek
6) Reach: Lowest
7) Length surveyed (m): 50m
8) Crew: T. RITCHIE
9) Community Watershed: Y (N)
10) Wet. Width (m): 1.2
11) Channel width (m): 1.2
12) Riffle depth (m): 0.15
13) Max. Depth (m): 0.30
14) Gradient %: 15%
15) Flow Type: P (I) E
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m):
18) Ground Conditions: D M W
19) Floodplain Width (m) (facing upstream): Left ____ Right ____

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %	—	40	45	10	5	—
Bank %	—	—	—	25	65	10

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	Y	(N)	Eroding Banks	Y	(N)
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %	100	5		100	5	
Distance (m)	5	20+		5	20+	

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	(N)	Pistol butt/jackstraw	Y	(N)
Disturbed Soils	Y	(N)	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H		
Size Present	F	(S)	M	L	
Debris Jams	(S)	M	L	None	
Sediment Wedges	(G)	C	B		
Debris Transport Potential	(T)	M	H	(see WTP on Gully Card)	
Largest Debris Size Moving	F	(S)	M	L	

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / (C)-Coniferous Forest

Tree Species	WS and ash	# Leaners (per 30m)	5
Deciduous Tree %	50	Ground Cover %	100
Ground Species		Canopy Cover%	80

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount: None (L) M H

Old/New: old

Species: ash/willow

Orientation: across

Wet Ground: Y (N)

Suspended Windfall: Y (N)

Shallow Root: Y (N)

Instream Windfall: (Y) N

28) Stream Classification: S6

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier N/A

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See data sheets

Water Sample Parameters: " "

Temp (°C): — Cond.: — pH: — Turbidity: —

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: 'muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services
ACCESS CONSULTING GROUP
#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867)-667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TML-02-01
2) Location: TML-06
3) Watershed: Bosswell River
4) Date: ~~Sept~~ Oct. 22/02
5) Stream: Bosswell River
6) Reach: 100m D/S of Red Mtn. Creek
7) Length surveyed (m): 100
8) Crew: T. RITCHIE
9) Community Watershed: Y (N)
10) Wet. Width (m): 8.0
11) Channel width (m): 8.0
12) Riffle depth (m): 0.5
13) Max. Depth (m): 0.6
14) Gradient %:
15) Flow Type: (P) I E
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m):
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left 10 m Right /

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		40	40	15	5	
Bank %			10	40	40	10

21) Channel Characteristics

Stable	Y	(N)	Old Stream Channels	(Y)	N
Undercut Banks	(Y)	N	Eroding Banks	(Y)	N
Flood Channels	(Y)	N →	How Many?	2	

22) Sidewalls

	Left			Right		
Slope %	20	10		80	20	10
Distance (m)	2	20+		1.0	5	20+

24) Slope Stability (slopes <3m. high only)

Evident Slumps	(Y)	N	Pistol butt/jackstraw	(Y)	N
Disturbed Soils	(Y)	N	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	L	(M)	H	
Size Present	F	S	(M)	L
Debris Jams	(S)	M	L	None
Sediment Wedges	(G)	C	B	
Debris Transport Potential	L	(M)	H	(see WTP on Gully Card)
Largest Debris Size Moving	F	S	(M)	L

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species: W.S. & Willow
Leaners (per 30m): 6-10
Deciduous Tree % – 35
Pine, Poplar
Ground Cover %: 100
Ground Species: moss, lichens
Canopy Cover%: 15%

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount: None (L) M H

Old/New: Old

Species: Pine, Willow, Poplar

Orientation: across/in/out

Wet Ground: (Y) N

Suspended Windfall: Y (N)

Shallow Root: (Y) N

Instream Windfall: (Y) N

28) Stream Classification: S2 (S1)

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier N/A

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See data sheets

Water Sample Parameters: " " "

" " "

Temp (°C): _____ Cond.: _____ pH: _____ Turbidity: _____

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: 'muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services
ACCESS CONSULTING GROUP
#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TML-02-01
2) Location: TML-07
3) Watershed: Bosswell River
4) Date: Oct. 22/02
5) Stream: Red Mountain Creek
6) Reach: Lowest
7) Length surveyed (m): 100
8) Crew: T. RITCHIE
9) Community Watershed: Y (N)
10) Wet. Width (m): 15
11) Channel width (m): 15
12) Riffle depth (m): 0.4
13) Max. Depth (m): 1.0
14) Gradient %: 15
15) Flow Type: (P) I E
16) Present Flow: None L M (H)
17) Avg. Bank Ht. (m): 1.0
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left 2 Right 2

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		30	20	35	15	
Bank %		<1	10	40	40	10

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	(Y)	N	Eroding Banks	(Y)	N
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %	80	10		80	10	
Distance (m)	0.5	20+		0.5	20+	

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	(N)	Pistol butt/jackstraw	Y	(N)
Disturbed Soils	(Y)	N	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	L	(M)	H		
Size Present	F	S	(M)	L	
Debris Jams	(S)	M	L	None	
Sediment Wedges	(G)	C	B		
Debris Transport Potential	L	(M)	H	(see WTP on Gully Card)	
Largest Debris Size Moving	F	S	(M)	L	

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / (M)ixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	W.S., Willow, Ash	# Leaners (per 30m)	2
Deciduous Tree %	<10 Poplar	Ground Cover %	100
Ground Species	moss, lichen	Canopy Cover%	10

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6660
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount	None	(L)	M	H	Species	W.S, Pine Poplar	
Old/New	old						
Orientation	across/in/out						
Wet Ground	(Y)	N			Suspended Windfall	Y	(N)
Shallow Root	(Y)	N			Instream Windfall	(Y)	N

28) Stream Classification: S2

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See data sheets

Water Sample Parameters: (

Temp (°C): _____ Cond.: _____ pH: _____ Turbidity: L-M

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: 'muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TML·02·01
2) Location: TML·08
3) Watershed: Bosswell River
4) Date: Oct. 21/02
5) Stream: Bosswell River
6) Reach: U/S - Road Mark Creek
7) Length surveyed (m): 100
8) Crew: T. RITCHIE
9) Community Watershed: Y (N)
10) Wet. Width (m): 5.5
11) Channel width (m): 6.0
12) Riffle depth (m): 0.15
13) Max. Depth (m): 0.5
14) Gradient %: <5%
15) Flow Type: (P) I E
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m): ____
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left 10 Right 30

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %	—	10	70	10	10	—
Bank %	—	—	20	30	50	<5

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	(Y)	N	Eroding Banks	(Y)	N
Flood Channels	(Y)	N →	How Many?	1	

22) Sidewalls

	Left			Right		
Slope %	90	35 5		90	5	
Distance (m)	1.0	20+		0.5	20+	

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	(N)	Pistol butt/jackstraw	(Y)	N
Disturbed Soils	Y	(N)	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H		
Size Present	F	(S)	M	L	
Debris Jams	(S)	M	L	None	
Sediment Wedges	(G)	C	B		
Debris Transport Potential	L	(M)	H	(see WTP on Gully Card)	
Largest Debris Size Moving	F	(S)	M	L	

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	B.S. W.S. Pine Willow	# Leaners (per 30m)	2
Deciduous Tree %	Alder <10	Ground Cover %	60
Ground Species	grasses, legumes	Canopy Cover%	<15

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services
ACCESS CONSULTING GROUP
#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount (None) L M H

Old/New _____ Species _____

Orientation _____

Wet Ground	Y	N	Suspended Windfall	Y	N
Shallow Root	Y	N	Instream Windfall	Y	N

28) Stream Classification: S2(S1)

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See data sheets

Water Sample Parameters: " " "

Temp (°C): 3.6 Cond.: — pH: — Turbidity: L

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: `muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TML-02-01
2) Location: TML-09
3) Watershed: Bosswell River
4) Date: Oct. 21/02
5) Stream: Chalco Creek
6) Reach: Lowest
7) Length surveyed (m): 100
8) Crew: T. K. TCHIE
9) Community Watershed: Y (N)
10) Wet. Width (m): 2.5
11) Channel width (m): 4.0
12) Riffle depth (m): 0.15
13) Max. Depth (m): 0.6
14) Gradient %: 25
15) Flow Type: (P) (E) ?
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m): 0.5
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left _____ Right _____

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		50	20	20	<10	<10
Bank %		10	20	50	25	<5

21) Channel Characteristics

Stable	Y (N)		Old Stream Channels	Y	(N)
Undercut Banks	(Y)	N	Eroding Banks	(Y)	N
Flood Channels	(Y)	N →	How Many?	1	

22) Sidewalls

	Left			Right		
Slope %	100	20		100	20	
Distance (m)	0.5	20+		0.5	20+	

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y (N)		Pistol butt/jackstraw	(Y)	N
Disturbed Soils	(Y)	N	Mild Gullying	Y	(N)
FPC Gully	Y (N)		If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H		
Size Present	F	S	(M)	L	
Debris Jams	S	M	L	(None)	
Sediment Wedges	(G)	C	B		
Debris Transport Potential	L	M	(H)	(see WTP on Gully Card)	
Largest Debris Size Moving	F	S	(M)	L	

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	W-S, willow	# Leaners (per 30m)	1
Deciduous Tree %	<10	Ground Cover %	60
Ground Species	moss, grasses, lichens	Canopy Cover%	10

ACCESS CONSULTING GROUP
■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services
#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount (None) L M H

Old/New _____ Species _____

Orientation _____

Wet Ground	Y	N	Suspended Windfall	Y	N
Shallow Root	Y	N	Instream Windfall	Y	N

28) Stream Classification: S5

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier

Type: (falls) cascade culvert beaverdam logjam other

Height (m) 10 m Gradient % 80 Length (m) 20

Pool Depth (m) 1

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See data sheets

Water Sample Parameters: " " "

Temp (°C): 3.3 Cond.: 110 pH: ✓ Turbidity: M

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: `muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TML-02-01
2) Location: TML-10
3) Watershed: Bosswell River
4) Date: Oct. 21/02
5) Stream: Red Mountain Creek
6) Reach: u/s Thalco Creek
7) Length surveyed (m): 100
8) Crew: T. Ritchie
9) Community Watershed: Y (N)
10) Wet. Width (m): 4.0
11) Channel width (m): 4.0
12) Riffle depth (m): 0.3
13) Max. Depth (m): 0.5
14) Gradient %: ~5
15) Flow Type: (P) I E
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m): 0.5
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left _____ Right _____

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %	—	—	65	25	10	<1
Bank %			~~15~~	50	25	10

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	Y	(N)	Eroding Banks	Y	(N)
Flood Channels	~~(Y)~~	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %	80	10		80	15	
Distance (m)	0.8	20+		0.5	15	

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	(N)	Pistol butt/jackstraw	Y	(N)
Disturbed Soils	Y	(N)	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H	
Size Present	F	(S)	M	L
Debris Jams	S	M	L	(None)
Sediment Wedges	G	C	B	
Debris Transport Potential	(L)	M	H	(see WTP on Gully Card)
Largest Debris Size Moving	F	(S)	M	L

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	B.S. / W.S. Willow	# Leaners (per 30m)	—
Deciduous Tree %	95	Ground Cover %	100%
Ground Species	moss, grasses, lichens	Canopy Cover%	<1%

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services
ACCESS CONSULTING GROUP
#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6483 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount (None) L M H

Old/New _____ Species _____

Orientation _____

Wet Ground	Y	N	Suspended Windfall	Y	N
Shallow Root	Y	N	Instream Windfall	Y	N

28) Stream Classification: S3 (S6)

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier ~~(Y)~~ N

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See data sheets

Water Sample Parameters: " " "

Temp (°C): 3.8 Cond.: 100 pH: — Turbidity: L

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: `muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: TMC-02-01
2) Location: TMC-1
3) Watershed: Boswell River
4) Date: Oct. 21/02
5) Stream: Chalco Creek
6) Reach: See Map
7) Length surveyed (m): 100
8) Crew: T. RITCHIE
9) Community Watershed: Y (N)
10) Wet. Width (m): 1.75
11) Channel width (m): 2.0
12) Riffle depth (m): 0.15
13) Max. Depth (m): 0.25
14) Gradient %: 3/10%
15) Flow Type: P I (E)
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m): 0.4
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left 40+ Right 10+

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		60	35	<5	<5	<5
Bank %			10	25	50	15

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	(Y)	N	Eroding Banks	Y	(N)
Flood Channels	(Y)	N →	How Many?	2	

22) Sidewalls

	Left			Right		
Slope %	80	-10		80	10	
Distance (m)	0.5	30+		0.5	30+	

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	(N)	Pistol butt/jackstraw	Y	(N)
Disturbed Soils	Y	(N)	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H	
Size Present	(F)	S	M	L
Debris Jams	S	M	L	(None)
Sediment Wedges	G	C	B	
Debris Transport Potential	(L)	M	H	(see WTP on Gully Card)
Largest Debris Size Moving	(F)	S	M	L

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	Willow	# Leaners (per 30m)	N/A
Deciduous Tree %	95%	Ground Cover %	100
Ground Species	grass, willow, lichens, moss	Canopy Cover%	<5

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services
ACCESS CONSULTING GROUP
#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6660
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount (None) L M H

Old/New _____ Species _____

Orientation _____

Wet Ground	Y	N	Suspended Windfall	Y	N
Shallow Root	Y	N	Instream Windfall	Y	N

28) Stream Classification: S6

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: Grab

Soil Sample Parameters: See data sheets

Water Sample Parameters: 1\ 1< 1/

Temp (^oC): _____ Cond.: _____ pH: _____ Turbidity: L

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: `muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services
ACCESS CONSULTING GROUP
#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: RED MOUNTAIN
2) Location: TM-12
3) Watershed: TESLIN / YUKON RIVER
4) Date: July 9/2005
5) Stream: SLATE CREEK TRIB.
6) Reach:
7) Length surveyed (m):
8) Crew: Rob McIntyre, Jennifer Taylor, Jessica McIntyre
9) Community Watershed: Y (N)
10) Wet. Width (m): 0.45m
11) Channel width (m):
12) Riffle depth (m):
13) Max. Depth (m): 0.12m
14) Gradient %:
15) Flow Type: P I (E)
16) Present Flow: None (L) M H
17) Avg. Bank Ht. (m):
18) Ground Conditions: D (M) W
19) Floodplain Width (m) (facing upstream): Left _____ Right _____

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		-	-	10	90	-
Bank %						

21) Channel Characteristics

Stable	Y	N	Old Stream Channels	Y	(N)
Undercut Banks	Y	N	Eroding Banks	Y	(N)
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %						
Distance (m)						

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	N	Pistol butt/jackstraw	Y	N
Disturbed Soils	Y	N	Mild Gullying	Y	N
FPC Gully	Y	N	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	L	M	H	
Size Present	F	S	M	L
Debris Jams	S	M	L	(None)
Sediment Wedges	G	C	B	
Debris Transport Potential	(L)	M	H	(see WTP on Gully Card)
Largest Debris Size Moving	(F)	S	M	L

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	W	# Leaners (per 30m)	0
Deciduous Tree %	5%	Ground Cover %	95%
Ground Species	W/G	Canopy Cover%	

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

TM-12

27) Windthrow

Amount (None) L M H

Old/New _____ Species _____

Orientation _____

Wet Ground (Y) N Suspended Windfall Y (N)

Shallow Root Y (N) Instream Windfall Y (N)

28) Stream Classification: S6

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: (Y) N Method: GRAB

Soil Sample Parameters: _____

Water Sample Parameters: _____

Temp (°C): _____ Cond.: _____ pH: _____ Turbidity: _____

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: `muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1)	Project	Red Mountain	2)	Location	TM-13
3)	Watershed	Teslin / Yukon River	4)	Date	09/07/05
5)	Stream	Boswell River	6)	Reach	
7)	Length surveyed (m)		8)	Crew	Rosa Ricks / David Pelkovich, Scott Keesey / Charlie (Trans Mtn)
9)	Community Watershed	Y (N)			
10)	Wet. Width (m)	23.9	11)	Channel width (m)	25.0 m
12)	Riffle depth (m)	0.6	13)	Max. Depth (m)	1.2 m
14)	Gradient %		15)	Flow Type	(P) I E
16)	Present Flow	None L (M) H			
17)	Avg. Bank Ht. (m)	1.0	18)	Ground Conditions	D (M) W
19)	Floodplain Width (m) (facing upstream)	Left 0		Right 0	

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		15	60	20	5	0
Bank %						

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks (minimal)	(Y)	N	Eroding Banks	Y	(N)
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %		45			0	
Distance (m)		3m			—	

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	(N)	Pistol butt/jackstraw	Y	(N)
Disturbed Soils	Y	(N)	Mild Gullying	Y	(N)
FPC Gully	Y	(N)	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H	
Size Present	(F)	S	M	L
Debris Jams	S	M	L	(None)
Sediment Wedges	(G)	C	B	
Debris Transport Potential	L	M	H	(see WTP on Gully Card)
Largest Debris Size Moving	F	(S)	M	L

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	C - BL. SP.	# Leaners (per 30m)	1
Deciduous Tree %	5	Ground Cover %	100
Ground Species	G, S (Alder)	Canopy Cover%	80

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount	None	(L)	M	H			
Old/New	Old				Species	Bl sp / Aspen (cottonwood)	
Orientation							
Wet Ground		Y	(N)		Suspended Windfall	(Y)	N
Shallow Root		Y	(N)		Instream Windfall	Y	(N)

28) Stream Classification: S1

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	(Y)	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier Ø

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c°)	Method	Set	Pulled	#Fish	Species	Size
TM-13	9.5	Electro	10:45	11:05	8	CH 0+	55-68 mm
TM-13	"	"	"	"	1	SS	25 mm
TM-13	"	Gee-Traps	11:15				

Comments:

Common Mergansers (COME) - large family group 15+

Environmental Sampling Completed: Y N Method: _____

Soil Sample Parameters: _____

Water Sample Parameters: _____

Temp (°C): 9.5 Cond.: 80 pH: 7.4 Turbidity: C

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: 'muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1) Project: Rod Mtn
2) Location: C-B
3) Watershed: Swift River to Teslin
4) Date: 26/07/05
5) Stream: Unnamed
6) Reach:
7) Length surveyed (m):
8) Crew: Rick / Rob
9) Community Watershed: Y N
10) Wet. Width (m): 10.0
11) Channel width (m): 20 m
12) Riffle depth (m): 0.25
13) Max. Depth (m): 0.5
14) Gradient %:
15) Flow Type: (P) I E
16) Present Flow: None L (M) H
17) Avg. Bank Ht. (m):
18) Ground Conditions: D M W
19) Floodplain Width (m) (facing upstream): Left Right

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		15	60	15	10	
Bank %						

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	(Y)	N	Eroding Banks	Y	(N)
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %						
Distance (m)						

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	N	Pistol butt/jackstraw	Y	N
Disturbed Soils	Y	N	Mild Gullying	Y	N
FPC Gully	Y	N	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H		
Size Present	(F)	S	M	L	
Debris Jams	(S)	M	L	None	
Sediment Wedges	G	C	B		
Debris Transport Potential	L	M	H	(see WTP on Gully Card)	
Largest Debris Size Moving	F	S	M	L	

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species: willow / Alder / B
Leaners (per 30m):
Deciduous Tree %:
Ground Cover %:
Ground Species:
Canopy Cover%:

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount None L M H

Old/New _____ Species _____

Orientation _____

Wet Ground Y N Suspended Windfall Y N

Shallow Root Y N Instream Windfall Y N

28) Stream Classification: _____

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments: #Electrofish
3 Gee traps set 26/09/05 @ 15:15

Environmental Sampling Completed: Y N Method: _____

Soil Sample Parameters: _____

Water Sample Parameters: _____

Temp (°C): 9.8 Cond.: 200 pH: 7.8 Turbidity: clear

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: 'muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1)	Project	Rod Mtn	2)	Location	C-16
3)	Watershed	Middle / Sikanay	4)	Date	26/07/05
5)	Stream	Twin Creek	6)	Reach	
7)	Length surveyed (m)		8)	Crew	Pethowick / Rick
9)	Community Watershed	Y N			
10)	Wet. Width (m)	10m	11)	Channel width (m)	15m
12)	Riffle depth (m)	0.4m	13)	Max. Depth (m)	0.6m
14)	Gradient %		15)	Flow Type	(P) I E
16)	Present Flow	None L (M) H			
17)	Avg. Bank Ht. (m)		18)	Ground Conditions	D (M) W
19)	Floodplain Width (m) (facing upstream)	Left		Right	

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %	/	25	50	20	5	—
Bank %						

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	(Y)	N	Eroding Banks	Y	(N)
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %						
Distance (m)						

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	N	Pistol butt/jackstraw	Y	N
Disturbed Soils	Y	N	Mild Gullying	Y	N
FPC Gully	Y	N	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	L	M	H	
Size Present	F	S	M	L
Debris Jams	S	M	L	None
Sediment Wedges	G	C	B	
Debris Transport Potential	L	M	H	(see WTP on Gully Card)
Largest Debris Size Moving	F	S	M	L

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	Pl Sb (M) willow/r.sh.	# Leaners (per 30m)	
Deciduous Tree %	Bl Sp 60	Ground Cover %	100
Ground Species	pine	Canopy Cover%	10

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount None L M H

Old/New _____ Species _____

Orientation _____

Wet Ground Y N Suspended Windfall Y N

Shallow Root Y N Instream Windfall Y N

28) Stream Classification: _____

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments: Bee Traps not suitable for Electro fishing

Environmental Sampling Completed: Y N Method: _____

Soil Sample Parameters: _____

Water Sample Parameters: _____

_____

Temp (°C): 10 Cond.: 40 pH: _____ Turbidity: clear

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: 'muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1)	Project	Rod Mtn	2)	Location	C-17
3)	Watershed	Misuthi	4)	Date	26/07/05
5)	Stream	Sidney Creek	6)	Reach	
7)	Length surveyed (m)		8)	Crew	Ricky / Rod
9)	Community Watershed	Y (N)			
10)	Wet. Width (m)	20 m	11)	Channel width (m)	25 m
12)	Riffle depth (m)	0.3	13)	Max. Depth (m)	0.5
14)	Gradient %		15)	Flow Type	(P) I E
16)	Present Flow	None L (M) H			
17)	Avg. Bank Ht. (m)	1.0	18)	Ground Conditions	D M W
19)	Floodplain Width (m) (facing upstream)	Left		Right	

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		10	70	15	5	—
Bank %						

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	N
Undercut Banks	(Y)	N	Eroding Banks	Y	N
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %						
Distance (m)						

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	N	Pistol butt/jackstraw	Y	N
Disturbed Soils	Y	N	Mild Gullying	Y	N
FPC Gully	Y	N	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	L	M	H	
Size Present	F	S	M	L
Debris Jams	S	M	L	None
Sediment Wedges	G	C	B	
Debris Transport Potential	L	M	H	(see WTP on Gully Card)
Largest Debris Size Moving	F	S	M	L

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	willow/alder/sp.	# Leaners (per 30m)	
Deciduous Tree %		Ground Cover %	
Ground Species		Canopy Cover%	

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount None L M H

Old/New _____ Species _____

Orientation _____

Wet Ground Y N Suspended Windfall Y N

Shallow Root Y N Instream Windfall Y N

28) Stream Classification: _____

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier

Type: falls cascade culvert beaverdam logjam other

Height (m) _____ Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments:

Environmental Sampling Completed: Y N Method: _____

Soil Sample Parameters: _____

Water Sample Parameters: _____

_____

Temp (^oC): _____ Cond.: _____ pH: _____ Turbidity: Clear

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: `muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

1)	Project	Red Mountain	2)	Location	C-18
3)	Watershed	Nisutlin R	4)	Date	26/07/05
5)	Stream	Iron Creek	6)	Reach	
7)	Length surveyed (m)	100	8)	Crew	Petkovich / Kiely
9)	Community Watershed	Y (N)			
10)	Wet. Width (m)	1.5	11)	Channel width (m)	20
12)	Riffle depth (m)	0.3	13)	Max. Depth (m)	0.6
14)	Gradient %		15)	Flow Type	(P) I E
16)	Present Flow	None L (M) H			
17)	Avg. Bank Ht. (m)	1.5	18)	Ground Conditions	D M W
19)	Floodplain Width (m) (facing upstream)	Left		Right	

20) Substrate

	BR	B(>25cm)	C(6-25cm)	G(0.2-6cm)	F(<0.2cm)	Organic
Bed %		30	50	15	5	—
Bank %						

21) Channel Characteristics

Stable	(Y)	N	Old Stream Channels	Y	(N)
Undercut Banks	Y	(N)	Eroding Banks	Y	(N)
Flood Channels	Y	(N) →	How Many?		

22) Sidewalls

	Left			Right		
Slope %						
Distance (m)						

24) Slope Stability (slopes <3m. high only)

Evident Slumps	Y	N	Pistol butt/jackstraw	Y	N
Disturbed Soils	Y	N	Mild Gullying	Y	N
FPC Gully	Y	N	If yes fill in Gully Assessment Card		

25) Instream Debris

Loading	(L)	M	H		
Size Present	(F)	S	M	L	
Debris Jams	S	M	L	(None)	
Sediment Wedges	G	C	B		
Debris Transport Potential	(L)	M	H	(see WTP on Gully Card)	
Largest Debris Size Moving	(F)	S	M	L	

Fines: twig & needles < 1 cm dbh)
Small: 1-5 cm dbh, <1 m long
Medium: 5-10 cm dbh, 1-3 m long
Large: > 10 cm dbh, > 3 m long

26) Streamside Vegetation

Riparian Class (single most dominant vegetation cover):
N-None / D-Deciduous Forest / G-Grass / M-Mixed Forest / S-Shrub / W- Wetland / C-Coniferous Forest

Tree Species	Subalpine spruce/aspen	# Leaners (per 30m)	
Deciduous Tree %	90 (c.w)	Ground Cover %	
Ground Species		Canopy Cover%	

■ Access Mining Consultants Ltd.
■ Access Field Services Ltd.
■ Access Oil & Gas Services

ACCESS CONSULTING GROUP

#3 Calcite Business Centre -151 Industrial Road, Whitehorse, Yukon Y1A 2V3
PHONE (867) 668-6463 FAX (867) 667-6680
www.accessconsulting.ca

STREAMSIDE CHECKLIST

27) Windthrow

Amount None L M H

Old/New _____ Species _____

Orientation _____

Wet Ground Y N Suspended Windfall Y N

Shallow Root Y N Instream Windfall Y N

28) Stream Classification: _____

Basis of Evaluation (W G F)

Operational Prescriptions:

RMA Width:

Reserve Zone (m) _____

Mgmt. Zone (m) _____

Class	Width (m)	Fish	RRZ	RMZ
S1	>20	Y	50	20
S2	>5 ≤ 20	Y	30	20
S3	1.5 ≤ 5	Y	20	20
S4	< 1.5	Y	0	30
S5	> 3	N	0	30
S6	≤ 3	N	0	20

29) Fish Barrier – u/s 500m from site

Type: falls cascade culvert beaverdam logjam other

Height (m) 6 Gradient % _____ Length (m) _____

Pool Depth (m) _____

30) Fish Sampling Fish Observed Y N

Site #	T (c^0)	Method	Set	Pulled	#Fish	Species	Size

Comments: Electrofishing – #20s
Gee Traps – set 11:40 on July 26/05

Environmental Sampling Completed: Y N Method: _____

Soil Sample Parameters: _____

Water Sample Parameters: _____

Temp (°C): 9.5 Cond.: 60 pH: _____ Turbidity: clear

Turbidity:
(T) – Turbid: muddy, brown water with visibility restricted to a few centimetres;
(M) - Moderately Turbid: `muddy,' water with increased visibility in shallow areas; general shapes on bed surface can be discerned, but deeper areas are not visible;
(L) - Lightly Turbid: features can be distinguish in shallow areas, and limited visibility in slightly deeper pools (~>1.5 m);
(C) - Clear Water: excellent visibility except in very deep areas.

Red Mountain, Yukon, Canada

Baseline Biophysical Study
Results Summary Report for
2002-2005 Data Collection Exercises

Appendix B

Stream Flow Data

Tintina Mines Ltd. Red Mountain Stream Flow Measurements 2002

Monitoring Station - TM-02

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	Q(avg)	
RHB	0										
	0.5	0.2	0.12	24	40	0.41242	0.625	0.125	0.0515525		
	0.5	0.2	0.12	25	40	0.4294375	0.625	0.125	0.053679688	0.052616094	
	1.25	0.45	0.27	75	40	1.2803125	0.75	0.3375	0.432105469		
	1.25	0.45	0.27	74	40	1.263295	0.75	0.3375	0.426362063	0.429233766	
	2	0.4	0.24	37	40	0.6336475	0.625	0.25	0.158411875		
	2	0.4	0.24	39	40	0.6676825	0.625	0.25	0.166920625	0.16266625	
LHB	2.5										
								Total Discharge =		0.6445	m^3/sec

Monitoring Station - TM-03

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	Q(avg)	
RHB	0										
	2	0.4	0.24	50	40	0.854875	2	0.8	0.6839		
	2	0.4	0.24	49	40	0.8378575	2	0.8	0.670286	0.677093	
	4	0.5	0.30	49	40	0.8378575	2	1	0.8378575		
	4	0.5	0.30	51	40	0.8718925	2	1	0.8718925	0.854875	
	6	0.5	0.30	50	40	0.854875	2	1	0.854875		
	6	0.5	0.30	50	40	0.854875	2	1	0.854875	0.854875	
	8	0.4	0.24	50	40	0.854875	2	0.8	0.6839		
	8	0.4	0.24	51	40	0.8718925	2	0.8	0.697514	0.690707	
	10	0.3	0.18	50	40	0.854875	2	0.6	0.512925		
	10	0.3	0.18	48	40	0.82084	2	0.6	0.492504	0.5027145	
LHB	12										
								Total Discharge =		3.5803	m^3/sec

Monitoring Station - TM-05

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	Q(avg)	
RHB	0										
	0.4	0.21	0.13	50	40	0.854875	0.4	0.084	0.0718095		
	0.4	0.21	0.13	41	40	0.7017175	0.4	0.084	0.05894427	0.065376885	
	0.8	0.2	0.12	39	40	0.6676825	0.4	0.08	0.0534146		
	0.8	0.2	0.12	40	40	0.6847	0.4	0.08	0.054776	0.0540953	
LHB	1.2										
								Total Discharge =		0.1195	m^3/sec

Tintina Mines Ltd. Red Mountain Stream Flow Measurements 2002

Monitoring Station - TM-06

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	Q(avg)	
RHB	0										
	1	0.6	0.36	40	40	0.6847	1.25	0.75	0.513525		
	1	0.6	0.36	44	40	0.75277	1.25	0.75	0.5645775	0.53905125	
	2.5	0.6	0.36	40	40	0.6847	1.5	0.9	0.61623		
	2.5	0.6	0.36	41	40	0.7017175	1.5	0.9	0.63154575	0.623887875	
	4	0.8	0.48	50	40	0.854875	1.5	1.2	1.02585		
	4	0.8	0.48	52	40	0.88891	1.5	1.2	1.066692	1.046271	
	5.5	0.6	0.36	44	40	0.75277	1.5	0.9	0.677493		
	5.5	0.6	0.36	46	40	0.786805	1.5	0.9	0.7081245	0.69280875	
	7	0.44	0.26	42	40	0.718735	1.25	0.55	0.39530425		
	7	0.44	0.26	46	40	0.786805	1.25	0.55	0.43274275	0.4140235	
LHB	8										
								Total Discharge =		3.3160	m^3/sec

Monitoring Station - TM-07

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	Q(avg)	
RHB	0										
	1	0.5	0.30	45	40	0.7697875	1.25	0.625	0.481117188		
	1	0.5	0.30	47	40	0.8038225	1.25	0.625	0.502389063	0.491753125	
	2.5	0.5	0.30	45	40	0.7697875	1.5	0.75	0.577340625		
	2.5	0.5	0.30	45	40	0.7697875	1.5	0.75	0.577340625	0.577340625	
	4	0.4	0.24	35	40	0.5996125	1.5	0.6	0.3597675		
	4	0.4	0.24	32	40	0.54856	1.5	0.6	0.329136	0.34445175	
	5.5	0.5	0.30	45	40	0.7697875	1.5	0.75	0.577340625		
	5.5	0.5	0.30	45	40	0.7697875	1.5	0.75	0.577340625	0.577340625	
LHB	7										
								Total Discharge =		1.9909	m^3/sec

Monitoring Station - TM-08

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	Q(avg)	
RHB	0										
	1	0.1	0.06	27	40	0.4634725	1	0.1	0.04634725		
	1	0.1	0.06	25	40	0.4294375	1	0.1	0.04294375	0.0446455	
	2	0.25	0.15	55	40	0.9399625	1	0.25	0.234990625		
	2	0.25	0.15	56	40	0.95698	1	0.25	0.239245	0.237117813	
	3	0.3	0.18	65	40	1.1101375	1	0.3	0.33304125		
	3	0.3	0.18	59	40	1.0080325	1	0.3	0.30240975	0.3177255	
	4	0.35	0.21	75	40	1.2803125	1	0.35	0.448109375		
	4	0.35	0.21	71	40	1.2122425	1	0.35	0.424284875	0.436197125	
	5	0.4	0.24	75	40	1.2803125	1	0.4	0.512125		
	5	4	2.40	75	40	1.2803125	1	4	5.12125	2.8166875	
LHB	6										
								Total Discharge =		3.8524	m^3/sec

Tintina Mines Ltd. Red Mountain Stream Flow Measurements 2002

Monitoring Station - TM-09

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	Q(avg)	
RHB	0										
	0.5	0.24	0.14	64	40	1.09312	0.625	0.15	0.163968		
	0.5	0.24	0.14	66	40	1.127155	0.625	0.15	0.16907325	0.166520625	
	1.25	0.2	0.12	2	40	0.038035	0.75	0.15	0.00570525		
	1.25	0.2	0.12	70	40	1.195225	0.75	0.15	0.17928375	0.0924945	
	2	0.12	0.07	43	40	0.7357525	0.625	0.075	0.055181438		
	2	0.12	0.07	44	40	0.75277	0.625	0.075	0.05645775	0.055819594	
LHB	2.5										
								Total Discharge =		0.3148	m^3/sec

Monitoring Station - TM-10

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	Q(avg)	
RHB	0										
	1	0.22	0.13	40	40	0.6847	1	0.22	0.150634		
	1	0.22	0.13	39	40	0.6676825	1	0.22	0.14689015	0.148762075	
	2	0.35	0.21	78	40	1.331365	1	0.35	0.46597775		
	2	0.35	0.21	79	40	1.3483825	1	0.35	0.471933875	0.468955813	
	3	0.32	0.19	49	40	0.8378575	1	0.32	0.2681144		
	3	0.32	0.19	46	40	0.786805	1	0.32	0.2517776	0.259946	
LHB	4										
								Total Discharge =		0.8777	m^3/sec

Monitoring Station - TM-11

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	Q(avg)	
RHB	0										
	0.25	0.3	0.18	30	40	0.514525	0.375	0.1125	0.057884063		
	0.25	0.3	0.18	32	40	0.54856	0.375	0.1125	0.061713	0.059798531	
	0.75	0.4	0.24	58	40	0.991015	0.5	0.2	0.198203		
	0.75	0.4	0.24	55	40	0.9399625	0.5	0.2	0.1879925	0.19309775	
	1.25	0.3	0.18	40	40	0.6847	0.5	0.15	0.102705		
	1.25	0.3	0.18	36	40	0.61663	0.5	0.15	0.0924945	0.09759975	
LHB	1.75										
								Total Discharge =		0.3505	m^3/sec

Note: Flow measurements were not gathered at stations TM-01 and TM-04 due to high flow rates.

Tintina Mines Ltd. Red Mountain Stream Flow Measurements July 2005

Monitoring Station - TM-02

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q
RHB	0								
	0.2	0.5	0.30	25	46	0.37394565	0.2	0.1	0.037394565
	0.4	0.62	0.37	41	30	0.93429	0.2	0.124	0.11585196
	0.6	0.56	0.34	52	30	1.18388	0.2	0.112	0.13259456
	0.8	0.52	0.31	49	30	1.11581	0.2	0.104	0.11604424
	1	0.56	0.34	44	30	1.00236	0.2	0.112	0.11226432
	1.2	0.5	0.30	35	30	0.79815	0.2	0.1	0.079815
	1.4	0.42	0.25	26	30	0.59394	0.2	0.084	0.04989096
	1.6	0.36	0.22	31	30	0.70739	0.2	0.072	0.05093208
	1.8	0.24	0.14	19	30	0.43511	0.25	0.06	0.0261066
	2.1	0.2	0.12	14	30	0.32166	0.3	0.06	0.0192996
	2.4	0.16	0.10	13	45	0.20064667	0.55	0.088	0.017656907
LHB	3.2								
								Total Discharge =	0.7579 m^3/sec

Monitoring Station - TM-03

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q
RHB	1.5								
	2	0.24	0.14	28	30	0.63932	0.45	0.108	0.06904656
	2.4	0.7	0.42	32	30	0.73008	0.45	0.315	0.2299752
	2.9	0.52	0.31	28	45	0.42754667	0.5	0.26	0.111162133
	3.4	0.57	0.34	32	30	0.73008	0.5	0.285	0.2080728
	3.9	0.66	0.40	29	30	0.66201	0.5	0.33	0.2184633
	4.4	0.5	0.30	26	30	0.59394	0.5	0.25	0.148485
	4.9	0.54	0.32	18	30	0.41242	0.45	0.243	0.10021806
	5.3	0.58	0.35	32	30	0.73008	0.35	0.203	0.14820624
	5.6	0.52	0.31	26	30	0.59394	0.25	0.13	0.0772122
	5.8	0.57	0.34	34	30	0.77546	0.35	0.1995	0.15470427
	6.3	0.53	0.32	31	30	0.70739	0.5	0.265	0.18745835
	6.8	0.46	0.28	26	30	0.59394	0.6	0.276	0.16392744
	7.5	0.29	0.17	51	30	1.16119	0.725	0.21025	0.244140198
	8.25	0.46	0.28	15	30	0.34435	0.65	0.299	0.10296065
	8.8	0.36	0.22	25	30	0.57125	0.475	0.171	0.09768375
	9.2	0.35	0.21	20	30	0.4578	0.5	0.175	0.080115
	9.8	0.38	0.23	32	30	0.73008	0.8	0.304	0.22194432
	10.8	0.37	0.22	60	30	1.3654	0.75	0.2775	0.3788985
	11.3	0.58	0.35	44	30	1.00236	0.5	0.29	0.2906844
	11.8	0.6	0.36	38	30	0.86622	0.5	0.3	0.259866
	12.3	0.38	0.23	55	30	1.25195	0.6	0.228	0.2854446
	13	0.45	0.27	62	30	1.41078	0.6	0.27	0.3809106
	13.5	0.38	0.23	29	30	0.66201	0.6	0.228	0.15093828
	14.2	0.34	0.20	9	45	0.14014	0.6	0.204	0.02858856
	14.7	0.31	0.19	4	30	0.09476	0.5	0.155	0.0146878
	15.2	0.2	0.12	11	30	0.25359	0.55	0.11	0.0278949
LHB	15.8								
								Total Discharge =	4.381689111 m^3/sec

Note: Flow measurements were not gathered at station TM-01 due to high flow rates.

Tintina Mines Ltd. Red Mountain Stream Flow Measurements July 2005

Monitoring Station - TM-04

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q
RHB	1.1								
	1.5	0.37	0.22	28	30	0.63932	0.4	0.148	0.09461936
	1.9	0.16	0.10	24	30	0.54856	0.45	0.072	0.03949632
	2.4	0.3	0.18	32	30	0.73008	0.55	0.165	0.1204632
	3	0.3	0.18	40	30	0.9116	0.55	0.165	0.150414
	3.5	0.44	0.26	27	30	0.61663	0.7	0.308	0.18992204
	4.4	0.4	0.24	28	30	0.63932	0.7	0.28	0.1790096
	4.9	0.38	0.23	28	30	0.63932	0.55	0.209	0.13361788
	5.5	0.39	0.23	22	30	0.50318	0.75	0.2925	0.14718015
	6.4	0.34	0.20	30	30	0.6847	0.75	0.255	0.1745985
	7	0.3	0.18	30	30	0.6847	0.675	0.2025	0.13865175
	7.75	0.12	0.07	15	30	0.34435	0.85	0.102	0.0351237
LHB	8.7								
RHB	13.3								
	13.5	0.17	0.10	13	30	0.29897	0.3	0.051	0.01524747
	13.9	0.25	0.15	29	30	0.66201	0.35	0.0875	0.057925875
	14.2	0.26	0.16	28	30	0.63932	0.45	0.117	0.07480044
	14.8	0.16	0.10	29	30	0.66201	0.55	0.088	0.05825688
	15.3	0.45	0.27	45	30	1.02505	0.6	0.27	0.2767635
	16	0.45	0.27	39	30	0.88891	0.85	0.3825	0.340008075
	17	0.5	0.30	42	30	0.95698	1	0.5	0.47849
	18	0.48	0.29	35	30	0.79815	1	0.48	0.383112
	19	0.55	0.33	20	30	0.4578	1	0.55	0.25179
	20	0.54	0.32	5	45	0.07963333	1.5	0.81	0.064503
LHB	22								
								Total Discharge =	3.40399374 m^3/sec

Monitoring Station - TM-05

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q
RHB	0.2								
	0.4	0.21	0.13	8	45	0.12501333	0.15	0.0315	0.00393792
	0.5	0.28	0.17	6	30	0.14014	0.1	0.028	0.00392392
	0.6	0.26	0.16	21	30	0.48049	0.075	0.0195	0.009369555
	0.65	0.26	0.16	22	30	0.50318	0.05	0.013	0.00654134
	0.7	0.26	0.16	18	30	0.41242	0.075	0.0195	0.00804219
	0.8	0.24	0.14	15	30	0.34435	0.1	0.024	0.0082644
	0.9	0.2	0.12	15	30	0.34435	0.1	0.02	0.006887
	1	0.2	0.12	21	30	0.48049	0.1	0.02	0.0096098
	1.1	0.23	0.14	20	30	0.4578	0.1	0.023	0.0105294
	1.2	0.21	0.13	17	30	0.38973	0.1	0.021	0.00818433
	1.3	0.2	0.12	13	30	0.29897	0.1	0.02	0.0059794
	1.4	0.18	0.11	8	30	0.18552	0.1	0.018	0.00333936
LHB	1.5								
								Total Discharge =	0.084608615 m^3/sec

Tintina Mines Ltd. Red Mountain Stream Flow Measurements July 2005

Monitoring Station - TM-06

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q
RHB	0.5								
	1.8	0.22	0.13	13	45	0.20064667	0.9	0.198	0.03972804
	2.3	0.3	0.18	19	45	0.29140667	0.5	0.15	0.043711
	2.8	0.3	0.18	37	45	0.56368667	0.5	0.15	0.084553
	3.3	0.35	0.21	39	30	0.88891	0.5	0.175	0.15555925
	3.8	0.36	0.22	44	30	1.00236	0.6	0.216	0.21650976
	4.5	0.61	0.37	39	45	0.59394	0.6	0.366	0.21738204
	5	0.62	0.37	24	30	0.54856	0.5	0.31	0.1700536
	5.5	0.67	0.40	41	30	0.93429	0.6	0.402	0.37558458
	6.2	0.71	0.43	43	45	0.65444667	0.65	0.4615	0.302027137
	6.8	0.76	0.46	25	30	0.57125	0.6	0.456	0.26049
	7.4	0.7	0.42	33	30	0.75277	0.7	0.49	0.3688573
	8.2	0.5	0.30	18	30	0.41242	0.85	0.425	0.1752785
	9.1	0.59	0.35	18	30	0.41242	0.8	0.472	0.19466224
	9.8	0.62	0.37	37	30	0.84353	0.7	0.434	0.36609202
	10.5	0.54	0.32	12	30	0.27628	0.65	0.351	0.09697428
	11.1	0.55	0.33	32	45	0.48805333	0.5	0.275	0.134214667
	11.5	0.52	0.31	35	45	0.53343333	0.45	0.234	0.1248234
	12	0.4	0.24	17	45	0.26115333	0.5	0.2	0.052230667
LHB	12.5								
								Total Discharge =	3.37873148 m^3/sec

Monitoring Station - TM-07

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q
RHB	0.4								
	0.6	0.29	0.17	7	30	0.16283	0.2	0.058	0.00944414
	0.8	0.3	0.18	7	30	0.16283	0.2	0.06	0.0097698
	1	0.37	0.22	11	30	0.25359	0.15	0.0555	0.014074245
	1.1	0.38	0.23	16	30	0.36704	0.1	0.038	0.01394752
	1.2	0.35	0.21	25	30	0.57125	0.15	0.0525	0.029990625
	1.4	0.37	0.22	31	30	0.70739	0.15	0.0555	0.039260145
	1.5	0.38	0.23	39	30	0.88891	0.15	0.057	0.05066787
LHB	1.7								
RHB	2.2								
	2.4	0.16	0.10	52	30	1.18388	0.3	0.048	0.05682624
	2.8	0.42	0.25	33	30	0.75277	0.4	0.168	0.12646536
	3.2	0.3	0.18	35	30	0.79815	0.35	0.105	0.08380575
	3.5	0.38	0.23	30	30	0.6847	0.55	0.209	0.1431023
	4.3	0.22	0.13	25	30	0.57125	0.6	0.132	0.075405
	4.7	0.3	0.18	30	30	0.6847	0.4	0.12	0.082164
	5.1	0.37	0.22	25	30	0.57125	0.35	0.1295	0.073976875
	5.4	0.4	0.24	25	30	0.57125	0.3	0.12	0.06855
	5.7	0.45	0.27	37	30	0.84353	0.25	0.1125	0.094897125
LHB	5.9								
RHB	8.7								
	8.9	0.37	0.22	20	30	0.4578	0.25	0.0925	0.0423465
	9.2	0.5	0.30	15	30	0.34435	0.3	0.15	0.0516525
	9.5	0.57	0.34	22	30	0.50318	0.275	0.15675	0.078873465
	9.75	0.63	0.38	31	30	0.70739	0.2	0.126	0.08913114
	9.9	0.6	0.36	40	30	0.9116	0.225	0.135	0.123066
LHB	10.2								
								Total Discharge =	1.3574166 m^3/sec

Tintina Mines Ltd. Red Mountain Stream Flow Measurements July 2005

Monitoring Station - TM-08

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	
RHB	1									
	1.5	0.63	0.38	22	30	0.50318	0.5	0.315	0.1585017	
	2	0.79	0.47	15	30	0.34435	0.5	0.395	0.13601825	
	2.5	0.78	0.47	18	30	0.41242	0.4	0.312	0.12867504	
	2.8	0.73	0.44	25	30	0.57125	0.35	0.2555	0.145954375	
	3.2	0.7	0.42	30	30	0.6847	0.45	0.315	0.2156805	
	3.7	0.68	0.41	39	30	0.88891	0.4	0.272	0.24178352	
	4	0.68	0.41	33	30	0.75277	0.35	0.238	0.17915926	
	4.4	0.63	0.38	36	30	0.82084	0.35	0.2205	0.18099522	
	4.7	0.6	0.36	28	30	0.63932	0.4	0.24	0.1534368	
	5.2	0.53	0.32	25	30	0.57125	0.45	0.2385	0.136243125	
	5.6	0.47	0.28	24	30	0.54856	0.4	0.188	0.10312928	
	6	0.37	0.22	9	30	0.20821	0.7	0.259	0.05392639	
	7	0.22	0.13	2	45	0.03425333	1.4	0.308	0.010550027	
LHB	8.8									
								Total Discharge =	1.844053487	m^3/sec

Monitoring Station - TM-09

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	
RHB	0.7									
	1	0.08	0.05	5	45	0.07963333	0.25	0.02	0.001592667	
	1.2	0.16	0.10	8	45	0.12501333	0.2	0.032	0.004000427	
	1.4	0.22	0.13	9	30	0.20821	0.25	0.055	0.01145155	
	1.7	0.22	0.13	9	30	0.20821	0.175	0.0385	0.008016085	
	1.75	0.2	0.12	29	30	0.66201	0.15	0.03	0.0198603	
	2	0.24	0.14	40	30	0.9116	0.225	0.054	0.0492264	
	2.2	0.26	0.16	13	30	0.29897	0.2	0.052	0.01554644	
	2.4	0.27	0.16	48	30	1.09312	0.15	0.0405	0.04427136	
	2.5	0.26	0.16	34	30	0.77546	0.5	0.13	0.1008098	
LHB	3.4									
								Total Discharge =	0.254775028	m^3/sec

Monitoring Station - TM-10

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	
RHB	0.2									
	0.35	0.29	0.17	15	30	0.34435	0.125	0.03625	0.012482688	
	0.45	0.3	0.18	15	30	0.34435	0.175	0.0525	0.018078375	
	0.7	0.35	0.21	22	30	0.50318	0.25	0.0875	0.04402825	
	0.95	0.37	0.22	24	30	0.54856	0.25	0.0925	0.0507418	
	1.2	0.36	0.22	31	30	0.70739	0.225	0.081	0.05729859	
	1.4	0.36	0.22	28	30	0.63932	0.2	0.072	0.04603104	
	1.6	0.36	0.22	26	30	0.59394	0.25	0.09	0.0534546	
	1.9	0.34	0.20	20	30	0.4578	0.3	0.102	0.0466956	
	2.2	0.3	0.18	22	30	0.50318	0.3	0.09	0.0452862	
	2.5	0.3	0.18	22	30	0.50318	0.3	0.09	0.0452862	
	2.8	0.26	0.16	20	30	0.4578	0.3	0.078	0.0357084	
	3.1	0.24	0.14	15	30	0.34435	0.25	0.06	0.020661	
	3.3	0.21	0.13	15	30	0.34435	0.25	0.0525	0.018078375	
	3.6	0.12	0.07	16	30	0.36704	0.4	0.048	0.01761792	
LHB	4.1									
								Total Discharge =	0.511449038	m^3/sec

Tintina Mines Ltd. Red Mountain Stream Flow Measurements July 2005

Monitoring Station - TM-11

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	
RHB	0.3									
	0.45	0.25	0.15	12	30	0.27628	0.15	0.0375	0.0103605	
	0.6	0.3	0.18	16	30	0.36704	0.125	0.0375	0.013764	
	0.7	0.32	0.19	25	30	0.57125	0.1	0.032	0.01828	
	0.8	0.22	0.13	33	30	0.75277	0.1	0.022	0.01656094	
	0.9	0.2	0.12	29	30	0.66201	0.1	0.02	0.0132402	
	1	0.19	0.11	13	30	0.29897	0.3	0.057	0.01704129	
LHB	1.5									
								Total Discharge =	0.08924693	m^3/sec

Monitoring Station - TM-12

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	
RHB	0									
	0.15	0.12	0.07	12	30	0.27628	0.1	0.012	0.00331536	
	0.2	0.09	0.05	9	30	0.20821	0.15	0.0135	0.002810835	
LHB	0.45									
								Total Discharge =	0.006126195	m^3/sec

Monitoring Station - TM-13

Bank	Distance	Depth of Channel	Depth of Measurement	Revs	Time (s)	Velocity	Average Width	Area	Q	
RHB	1.9									
	3.2	0.56	0.34	16	45	0.24602667	1.05	0.588	0.14466368	
	4	0.69	0.41	26	45	0.39729333	0.9	0.621	0.24671916	
	5	0.84	0.50	41	45	0.62419333	1	0.84	0.5243224	
	6	0.84	0.50	42	30	0.95698	1	0.84	0.8038632	
	7	0.97	0.58	40	30	0.9116	1.3	1.261	1.1495276	
	8.6	1	0.60	32	30	0.73008	1.1	1.1	0.803088	
	9.2	0.95	0.57	33	30	0.75277	0.9	0.855	0.64361835	
	10.4	1.02	0.61	32	30	0.73008	2.9	2.958	2.15957664	
	15	0.94	0.56	31	30	0.70739	3.1	2.914	2.06133446	
	16.6	0.8	0.48	35	30	0.79815	1.5	1.2	0.95778	
	18	0.7	0.42	33	45	0.50318	1.2	0.84	0.4226712	
	19	0.6	0.36	45	45	0.6847	1	0.6	0.41082	
	20	0.51	0.31	35	45	0.53343333	1	0.51	0.272051	
	21	0.4	0.24	19	60	0.219555	1.95	0.78	0.1712529	
LHB	23.9									
								Total Discharge =	10.77128859	m^3/sec

Red Mountain, Yukon, Canada

Baseline Biophysical Study
Results Summary Report for
2002-2005 Data Collection Exercises

Appendix C

Monitoring Site and Study Area Photographs

Boswell River Monitoring Station TM-01 (Looking Upstream – East)

Slate Creek Monitoring Station TM-02 Showing Typical Station Marker (Looking Upstream –Southeast)

Monitoring Station TM-03 (Looking Upstream – North Northeast)

Boswell River Monitoring Station TM-04 (Looking Upstream – Southeast)

Silco Creek Monitoring Station TM-05 (Looking Upstream - South)

Boswell River Monitoring Station TM-06 (Looking Upstream - East)

Red Mountain Creek Monitoring Station TM-07 (Looking Downstream - North)

Boswell River Upstream Monitoring Station TM-08 (Looking Downstream - West)

Chalco Creek Monitoring Station TM-09 (Looking Downstream - East)

Red Mountain Creek Upstream Monitoring Station TM-10 (Looking Upstream - South)

Chalco Creek Upstream Monitoring Station TM-11 (Looking Downstream at Slate Mountain - Northeast)

Boswell River at Trail Crossing (Looking Southwest toward Red Mountain)

Boswell River at Trail Crossing (Looking Northeast)

Boswell River at Trail Crossing (Looking Upstream - East)

Water Sampling at Slate Creek Upstream Monitoring Station TM-12 (Est. 2005)

Measuring Flow at Boswell River Downstream Monitoring Station TM-13 (Est. 2005)

Boswell River Airstrip 2003 (Looking Northwest)

Single Otter Landing on Airstrip in 2003 (Looking Northwest)

Red Mountain, Yukon, Canada

Baseline Biophysical Study
Results Summary Report for
2002-2005 Data Collection Exercises

Appendix D

Summary of Fisheries Surveys

Red Mountain Project
Fisheries Investigations July-September 2005

Introduction/Background

Investigations into fish and fish habitat in the vicinity of Tintina Mines Ltd's Red Mountain Property and at stream crossings sites for a proposed access road were conducted in July, August and September of 2005. Previous fisheries investigations on the Boswell Creek watershed are limited to observations of fish made near the confluence with the Teslin River (Ferguson and Tobler., 2004). These previous investigations confirmed the presence of spawning chinook salmon as well as arctic grayling in the lower Boswell near the Teslin River. Literature search conducted by Ferguson and Tobler, 2005 commented that very little is known about the fisheries resources of the Boswell watershed. The report however did indicate the presence of a fish barrier (waterfalls and chute) located on the Boswell River approximately 5.0 km upstream of the Teslin confluence. This current study investigated fish and fish habitat at numerous sites Boswell River watershed upstream of the barrier as well as one site downstream.

Fish investigations were also conducted at various stream crossings located on a proposed access road. The proposed road would follow a route used previously to access the mine site. Previous fisheries investigations along the proposed access are limited to studies in the Sidney Creek watershed (DFO Files 2004). These investigations were conducted pursuant to the Yukon Placer Authorization. A Placer mining operation is currently established adjacent to Iron Creek, a tributary of Sidney Creek. The investigations along Sidney Creek confirmed the presence of adult chinook salmon. Other fish species observed in the system were arctic grayling, northern pike and slimy sculpins.

Fishery Investigations

Boswell River Watershed

Fish and fish habitat investigations were conducted on July 19 - 21, 2005 at nine sites within the Boswell River watershed. Sites included TM-01-05, TM-07-08, TM-10 and TM-13. Angling for fish in the Boswell river was conducted on July 27.

Stream Crossings

Investigations at stream crossings along the proposed access route were conducted on July 26 and 27, 2005. Sampling at the stream crossing along the Boswell River (giving access from the airstrip to the mine site) was conducted on July 21st.

Salmon Spawning/Redd Surveys

Aerial surveys for spawning salmon and redds were conducted along Boswell Creek, Swift river and Sidney Creek on August 26 and September 9, 2005.

Methods

In order assess fish habitat and to determine utilisation of fish at the various sampling sites in Boswell watershed or at the various stream crossings the sites were first observed from a helicopter. Sites that were deemed as potential fish habitat were

then visited on ground level and sampled for the fish presence using Gee-type minnow traps, electrofishing and/or angling. When minnow traps were used three traps were placed in suitable habitat in proximity of the site. Yukon River origin chinook salmon roe was used as an attractant.

Where stream/river conditions allowed certain sites were electrofished using a Smith/Root back-back electrofishing unit. Conductivity was measured at each site and this dictated the settings used on the electrofishing unit.

Angling effort was applied at several sites using both spin-casting and fly-fishing gear and appropriate lures.

All fish captured were identified, and enumerated. Juvenile chinook salmon were measured for fork-length and slimy sculpins for total length before release.

Habitat observations were made at each site visited and noted on streamside checklist forms. Incidental observations of fish or wildlife was also recorded.

In addition to conductivity and temperature in-situ water quality measurements were made for dissolved oxygen and pH, using oxyguard meters.

Spawning and redd surveys were conducted via low level (50-60 metres agl) helicopter reconnaissance with two or more observers during each survey. Ground level observations were also made at two stream crossings, C17 and C18 as they were considered potential spawning habitat for salmon. The survey conducted on August 26 included Boswell River from the confluence with the Teslin to Red Mountain Creek, Swift River from the Teslin River to C9 and Sidney Creek from Twin Creek to approximately 5.0 km. downstream of Iron Creek. Iron Creek, from its confluence with Sidney Creek up to a waterfalls located approximately 400 metres upstream of C18 crossing was also flown. All areas were flown again on September 9th with the exception of Swift River which was not flown on the second survey. Ground observations on September 9th at stream crossings C17 (Sidney Creek) and C18 (Iron Creek) were also conducted.

Results

Boswell Creek Watershed

Electrofishing was conducted at four sites (TM-01,08,10,13) within the watershed. Of these three are located on Boswell River and the fourth site (TM-10) is located on Red Mountain Creek upstream of Chalco Creek. Gee traps were set at eight sites (TM-01-05, 07-08, 13) and angling was conducted at one site (TM-04).

Sampling within the watershed resulted in the capture of 10 juvenile chinook salmon (*Oncorhynchus tshawytscha*) and 10 slimy sculpins (*Cottus cognatus).* Of these all chinook salmon were capture at TM-13 which is located downstream of the waterfall barrier near the confluence with the Teslin River. Only sculpins were captured upstream of the waterfalls.

Stream Crossings

A total of 18 sites (from Iron Creek eastward) were identified to cross a stream along the proposed access road to the mine site. Many of these crossings however are small high elevation streams with relatively low flow and were either not large enough to sample effectively and/or deemed unsuitable fish habitat due to downstream

barriers and thus were not sampled. As a result, of the 18 crossings identified by aerial reconnaissance, only five (C8, C9, C 16, C17, C18) were deemed suitable to support fish. Of these three were sampled and one site (C9) was not accessible and thus was not sampled. C9 however is similar to C8 which was sampled. Both creeks where these sites are situated are cascading mountain streams collecting water from a relatively small catchment area. An additional site on the Boswell River, where the access road from the airstrip crosses the river, was sampled.

Sampling effort at C8, C16, C17 and C18 resulted in the capture of 75 juvenile chinook salmon, 14 Arctic grayling and 6 slimy sculpins. All salmonids (salmon and grayling) were captured at C17 (Sidney Creek) and C8 (Iron Creek). No fish were captured at C16 (Twin Creek) and only slimy sculpins were found at C8. Three slimy sculpins were captured at the Boswell River road crossing.

Water Quality

In situ water quality measurements results are tabled. Temperatures within the Boswell Creek watershed ranged from 7.0 to 10.2 ^{o}C. The warmest temperature overall was found in Sidney Creek (11.5 ^{o}C). Conductivity ranged from a low of 30 *uS/cm* in the large unnamed tributary that joins the Boswell River downstream of the airstrip (TM-03) to a high of 200 at C8, a tributary of the Swift River. All sites where pH was measured were between 7.45 and 7.8. Dissolved oxygen levels ranged between 9.4 and 10.3 mg/l at all sites measured.

Spawning Salmon/ Redd surveys

Adult salmon were observed during the August 26th aerial survey at the following locations:

> Boswell River - one salmon observed downstream of the falls (GPS 543457 E / 6768120 N)
>
> Swift River - two salmon + two salmon carcasses observed downstream of Swift Lakes

No salmon were observed upstream of the falls on the Boswell River or in Sidney Creek/Iron Creek. No salmon were observed at any locations surveyed during September 9th. There was no evidence of salmon Redds in the vicinity of the stream crossings at Sidney Creek (C17) or Iron Creek (C18).

Comments

Boswell Creek Watershed

The falls located on the Boswell River (approximately 5.0 km upstream of the Teslin River) combined with a series of cascades and chutes appears to limit the distribution of fish in the Boswell River. Only slimy sculpins were captured or observed upstream of the falls. Some of the sculpins located upstream were relatively large in size (over 100 mm and up to 110 mm.), possibly indicative of a lack of predatory fish.

Tributaries flowing into the Boswell River from Slate Mountain including Slate Creek, Red Mountain Creek and Chalco Creek are swift, high gradient systems cascading off the mountain, providng limited habitat for fish. A significant waterfalls is located

on Chalco creek before it joins Red Mountain Creek. No fish were captured in slate Creek (TM-02) and only one sculpin was captured in Red Mountain Creek.

Salmon, both juveniles and adults were captured / observed in the Boswell River downstream of the falls. The habitat in this section of the river is varied and would be suitable for rearing and spawning salmon as well as grayling and other species of fish. Although not captured/observed during this survey arctic grayling are known to occur in the system below the falls (Ferguson and Tobler 2004). Ferguson and Tobler also identified spawning chinook salmon in the system. During surveys conducted for this report only one adult salmon was in the lower Boswell. It was not confirmed whether this salmon had or would spawn in the system.

Stream Crossings

Most of the stream crossings identified in this study consist of small mountain streams at relatively high altitudes that collect water from a limited area. The streams are small with relatively low flow and likely freeze solid during the winter and thus provide very limited fish habitat if any.

Crossings at C1 and C2 flow into Red Mountain Creek where only one sculpin was captured during the survey. Chalco Creek (C1) has a significant waterfalls downstream of the crossing site before it enters Red Mountain Creek. Streams at crossings C3-C5 collect into a common creek with a significant waterfalls located downstream of C5 location. Crossings C6-C7 are small creeks not large enough to sample for fish.

Sculpins were captured in C8 which provides good fish habitat and flows. The creek at C8 has relatively good flows that would likely provide year-round fish habitat. This creek however cascades down from the C8 location to the Swift river, possibly limiting access to some fish. The crossing at C9 was not accessible but from aerial observations appears to be similar to the creek at C8 accept with lower flow. Again this creek cascades down from an elevated location at C9 to the Swift River. This, combined with a series of beaver dams near its confluence with the Swift River may limit fish access. It is likely however that sculpins would be found inhabiting this creek if it were to be sampled.

Crossings C10-C15 are relatively small creeks (too small to sample for fish) and provide little or no fish habitat. These creeks also likely freeze solid in the winter. The creek where C14 is located has a significant waterfalls located downstream of the crossing before it drains into Sidney Creek. This creek also collects water from the creek at crossing C15.

No fish were captured or observed in Twin Creek at C16. This is a relatively large creek with good flow that cascades off the mountainside into Sidney Creek. The habitat appears to be suitable for fish although none were captured in the system.

Sidney Creek Crossing location (C17) and the crossing area at Iron Creek (C18) provides good habitat for rearing chinook salmon and other species of fish including arctic grayling. Northern pike (*Esox lucis*) are also known to inhabit the upper Sidney Creek system (DFO files 2004). No spawning chinook salmon or redds were observed in Sidney or Iron Creek within the vicinity of the proposed road crossing sites, however adult chinook salmon have been observed in Sidney Creek (DFO files 2004).

References

DFO Files 2004. Rationale for Classification: Sidney Creek – Tributary of Nisutlin River, YPA Map No. 17, Application No. 2004 – 02

Ferguson, N.L. and P. Tobler, 2004. Compilation and Mapping of Fiheries Information Within the Teslin Tlingit traditional Territory. CRE43-03. Prepared by EDI Environmental Dynamics Inc. March 2004.

Summary
Tintina Mines Ltd.
Red Mountain Project
Fisheries Assessment at Stream Crossings
July 26-27, 2005

	Effort			Number captured/species		
Site	**Electrofishing (s)**	**Gee traps (nom. 24 hr soak)**	**Angling (minutes)**	**CH**	**AG**	**SS**
C1-C5	0	0	0	0	0	0
C6-C7	0	0	0	0	0	0
C8	112	3	0	0	0	3
C9	0	0	0	0	0	0
C10-C11	0	0	0	0	0	0
C12-C15	0	0	0	0	0	0
C16	0	3	0	0	0	0
C17	99	3	15	6	2	2
C18	120	3	35	69	12	1
Boswell Ck	95	0	0	0	0	3

***Fish habitat potential - subjective assessment of site regardless of d/s or u/s influences**

Fish Barriers
Iron Creek - falls located 300 metres u/s of crossing (C-18)
C3-C5 - falls d/s of C5
C13 - falls d/s
C1-C7, C10-C15 small mountain streams probably very low or no winter flow due to freezing

Fish Habitat Potential*	Comment
low	small shallow mtn streams with d/s barriers (I.e.falls, cascades)
low	small shallow with d/s barrier (cascade)
medium	stream cascades d/s of site to Swift R
low	No access from Heli-cascading stream
low	min flow, poor hab
low	min flow, d/s barriers (falls, cascades)
medium	fast flowing, cascading
high	pools, riffles
high	AG captured in pool at bottom of falls u/s (300 m) of crossing
high	sampling conducted July 21

Summary
Tintina Mines Ltd.
Red Mountain Project
Fisheries Assessment in vicinity of Mine Site
July 19-21, 2005

	Effort			Number captured/species		
Site	**Electrofishing (s)**	**Gee traps (nom. 24 hr soak)**	**Angling (minutes)**	**CH**	**AG**	**SS**
TM-01	170	3	nil	0	0	1
TM-02	0	3	nil	0	0	0
TM-03	0	3	nil	0	0	2
TM-04	0	3	40	0	0	1
TM-05	0	3	nil	0	0	0
TM-06	0	0	nil	0	0	0
TM-07	0	3	nil	0	0	1
TM-08	95	3	nil	0	0	3
TM-09	0	0	nil	0	0	0
TM-10	56	0	nil	0	0	0
TM-11	0	0	nil	0	0	0
TM-12	0	0	0	0	0	0
TM-13	140	3	nil	10	0	2

***Fish habitat potential - subjective assessment of site regardless of d/s or u/s influences**

Fish Barriers
Boswell River - u/s of TM-13 - Cascade and falls (drop not measured) - only SS captured u/s

Fish Habitat Potential*	Comment
high	d/s barrier
low	rel. steep grade/ swift flow (cascade)
high	d/s barrier
high	angling conducted July 27
low	rel. steep grade/ swift flow (cascade)
high	immediately d/s of TM-08
medium	rel. steep grade/ swift flow (cascade)
high	d/s barrier
low	very steep grade/ cascade
medium	swift flow/some pool habitat
low	small/shallow-d/s barrier
low	small, sampled d/s near confluence
high	d/s of barrier

Tintina Mines Ltd.
Red Mountain Project
Fisheries Assessment in vicinity of Mine Site
July 19-21, 2005

Date	Site	fish #	Species	Fork-length*	Capture Method	Comment
7/19/2005	TM-13	1	CH 0+	68	E	
7/19/2005	TM-13	2	CH 0+	50	E	
7/19/2005	TM-13	3	CH 0+	65	E	
7/19/2005	TM-13	4	CH 0+	60	E	
7/19/2005	TM-13	5	CH 0+	58	E	
7/19/2005	TM-13	6	CH 0+	65	E	
7/19/2005	TM-13	7	CH 0+	64	E	
7/19/2005	TM-13	8	CH 0+	55	E	
7/19/2005	TM-13	9	SS	25	E	
7/20/2005	TM-13	10	CH 0+	72	G	
7/20/2005	TM-13	11	CH 0+	65	G	
7/20/2005	TM-13	12	SS	85	G	
7/20/2005	TM-01	13	SS	90	G	
7/20/2005	TM-08	14	SS	95	E	
7/20/2005	TM-08	15	SS	45	E	
7/21/2005	TM-03	16	SS	90	G	
7/21/2005	TM-03	17	SS	100	G	
7/21/2005	TM-04	18	SS	75	G	
7/21/2005	TM-07	19	SS	110	G	

Legend

Species

CH 0+	Chinook salmon young of year
CH 1+	Chinook salmon over one year
AG	Arctic grayling
SS	slimy sculpin *total length measured

Capture Method

E	Electrofishing
A	Angling
G	Gee-type Trap

fork-length

NM	no measuremnet

Tintina Mines Ltd.
Red Mountain Project
Fisheries Assessment at Stream Crossing sites
July 19-21, 2005

Date	Site	fish #	Species	Fork-length (mm)*	Capture Method	Comment
7/26/2005	C-18	1	SS	60	E	
7/26/2005	C-18	2	CH 0+	56	E	
7/26/2005	C-18	3	CH 0+	58	E	
7/26/2005	C-18	4	CH 0+	50	E	
7/26/2005	C-18	5	CH 0+	60	E	
7/26/2005	C-18	6	CH 0+	65	E	5 more opbserved
7/26/2005	C-18	7	AG	NM	A	juvenile
7/26/2005	C-18	8	AG	NM	A	juvenile
7/26/2005	C-18	9	AG	NM	A	juvenile
7/26/2005	C-18	10	AG	NM	A	juvenile
7/26/2005	C-18	11	AG	NM	A	juvenile
7/26/2005	C-18	12	AG	NM	A	juvenile
7/26/2005	C-18	13	AG	NM	A	juvenile
7/26/2005	C-18	14	AG	NM	A	juvenile
7/26/2005	C-18	15	AG	NM	A	s-adult
7/26/2005	C-18	16	AG	NM	A	s-adult
7/26/2005	C-18	16	AG	NM	A	s-adult
7/26/2005	C-18	17	AG	NM	A	Adult
7/26/2005	C-17	18	CH 0+	61	E	6 more Ch observed
7/26/2005	C-17	19	SS	62	E	
7/26/2005	C-17	20	AG	NM	A	juvenile
7/26/2005	C-17	21	AG	NM	A	juvenile
7/26/2005	C-8	22	SS	58	E	
7/26/2005	C-8	23	SS	48	E	
7/26/2005	C-8	24	SS	45	E	
7/27/2005	C-18	25	CH 1+	100	G	
7/27/2005	C-18	26	CH 0+	57	G	
7/27/2005	C-18	27	CH 0+	68	G	
7/27/2005	C-18	28	CH 0+	65	G	
7/27/2005	C-18	29	CH 0+	62	G	

7/27/2005	C-18	30	CH 0+	58	G
7/27/2005	C-18	31	CH 0+	66	G
7/27/2005	C-18	32	CH 0+	68	G
7/27/2005	C-18	33	CH 0+	56	G
7/27/2005	C-18	34	CH 0+	63	G
7/27/2005	C-18	35	CH 0+	64	G
7/27/2005	C-18	36	CH 0+	58	G
7/27/2005	C-18	37	CH 0+	58	G
7/27/2005	C-18	38	CH 0+	63	G
7/27/2005	C-18	39	CH 0+	60	G
7/27/2005	C-18	40	CH 0+	60	G
7/27/2005	C-18	41	CH 0+	63	G
7/27/2005	C-18	42	CH 0+	NM	G
7/27/2005	C-18	43	CH 0+	63	G
7/27/2005	C-18	44	CH 0+	60	G
7/27/2005	C-18	45	CH 0+	60	G
7/27/2005	C-18	46	CH 0+	68	G
7/27/2005	C-18	47	CH 0+	65	G
7/27/2005	C-18	48	CH 0+	65	G
7/27/2005	C-18	49	CH 0+	56	G
7/27/2005	C-18	50	CH 0+	63	G
7/27/2005	C-18	51	CH 0+	60	G
7/27/2005	C-18	52	CH 0+	58	G
7/27/2005	C-18	53	CH 0+	72	G
7/27/2005	C-18	54	CH 0+	59	G
7/27/2005	C-18	55	CH 0+	68	G
7/27/2005	C-18	56	CH 0+	58	G
7/27/2005	C-18	57	CH 0+	61	G
7/27/2005	C-18	58	CH 0+	NM	G
7/27/2005	C-18	59	CH 0+	72	G
7/27/2005	C-18	60	CH 0+	65	G
7/27/2005	C-18	61	CH 0+	58	G
7/27/2005	C-18	62	CH 0+	66	G
7/27/2005	C-18	63	CH 0+	68	G
7/27/2005	C-18	64	CH 0+	59	G
7/27/2005	C-18	65	CH 0+	61	G

7/27/2005	C-18	66	CH 0+	62	G
7/27/2005	C-18	67	CH 0+	58	G
7/27/2005	C-18	68	CH 0+	58	G
7/27/2005	C-18	69	CH 0+	60	G
7/27/2005	C-18	70	CH 0+	57	G
7/27/2005	C-18	71	CH 0+	59	G
7/27/2005	C-18	72	CH 0+	68	G
7/27/2005	C-18	73	CH 0+	63	G
7/27/2005	C-18	74	CH 0+	56	G
7/27/2005	C-18	75	CH 0+	62	G
7/27/2005	C-18	76	CH 0+	62	G
7/27/2005	C-18	77	CH 0+	64	G
7/27/2005	C-18	78	CH 0+	56	G
7/27/2005	C-18	79	CH 0+	58	G
7/27/2005	C-18	80	CH 0+	60	G
7/27/2005	C-18	81	CH 0+	NM	G
7/27/2005	C-18	82	CH 0+	67	G
7/27/2005	C-18	83	CH 0+	67	G
7/27/2005	C-18	84	CH 0+	NM	G
7/27/2005	C-18	85	CH 0+	63	G
7/27/2005	C-18	86	CH 0+	60	G
7/27/2005	C-18	87	CH 0+	58	G
7/27/2005	C-18	88	CH 0+	56	G
7/27/2005	C-17	89	SS	65	G
7/27/2005	C-17	90	CH 0+	67	G
7/27/2005	C-17	91	CH 0+	NM	G
7/27/2005	C-17	92	CH 0+	60	G
7/27/2005	C-17	93	CH 0+	65	G
7/27/2005	C-17	92	CH 1+	89	G

Legend

Species

CH 0+	Chinook salmon young of year

CH 1+	Chinook salmon over one year
AG	Arctic grayling
SS	slimy sculpin *total length measured

Capture Method

E	Electrofishing
A	Angling
G	Gee-type Trap

fork-length

NM	no measuremnet

Tintina Mines Ltd.
Red Mountain Project
Fisheries Assessment
In situ Water Quality at various sites
July, 2005

Date	Site	T °C	Cond	D.O.	pH
7/19/2005	TM-13	9.5	80	9.7	7.45
7/19/2005	TM-02	8.5	130	9.7	7.9
7/19/2005	TM-01	10.2	90	9.7	7.5
7/20/2005	TM-08	10	50	NM	NM
7/20/2005	TM-07	9	NM	NM	NM
7/20/2005	TM-10	NM	180	NM	NM
7/20/2005	TM-09	9.5	190	NM	NM
7/20/2005	TM-05	9.5	NM	NM	NM
7/21/2005	TM-03	7	30	10.3	7.5
7/21/2005	TM-04	7.2	90	10.3	7.5
7/21/2005	TM-05	7.5	170	NM	NM
7/26/2005	C-18	9.5	60	10.3	7.8
7/26/2005	C-17	11.5	90	9.8	7.8
7/26/2005	C-16	10	40	9.4	7.75
7/26/2005	C-8	9.8	200	98	7.8

Red Mountain, Yukon, Canada

Baseline Biophysical Study
Results Summary Report for
2002-2005 Data Collection Exercises

Appendix E

Wildlife Resources

Wildlife

Methodology

An overview of available information on large terrestrial mammals known to habituate the Boswell River and Sidney Creek drainages was collected by Grant Lortie, wildlife specialist. Information sources included interviews with Government of Yukon biologists, trapping concession holders, outfitters, and others familiar with the area. Additional anecdotal information on lower Sidney Creek, 100 Mile Creek, and Swift River is also noted. Interviews were conducted the week of August 19 – 25, 2005 (See Appendix A for list of interviewees).

Moose (*Alces alces*)

Detailed empirical data on moose numbers or composition is not available for the area. However, incidental moose groups observed during an early winter habitat stratification survey (2003) show three higher density locations on the study area at the time of the survey (see Map 1 - Moose Stratification Survey). Upper 100 Mile Creek and Flat Creek straddling the access road, the immediate vicinity of the mine site and access road to the south, and the area around Little Bear mountain immediately north of the confluence of Slate Creek and Boswell River. This distribution and timing likely represents post rut aggregations and rutting area. Yukon Government will not be intensively surveying this area in the near future.

As winter progresses and prohibitive snow depths accumulate at higher elevations, moose will move down the drainage flowing to the Nisutlin and Teslin Rivers. Noteworthy in this regard are Swift River and 100 Mile Creek (Guy Moon, pers comm.) and Sidney Creek below Iron Creek (George Bahm, pers comm.) (see Map 3 – Incidental Observations).

All parties interviewed expressed moose as a priority species in the area with unregulated public access as a major issue.

In order to confirm observations, a helicopter flight over the area is planned for mid- to late November, and possibly another in late February.

Woodland Caribou (*Rangifer tarandus caribou*)

The woodland caribou is classified under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as special concern. The caribou on the Red Mountain study area belong to the Carcross population. As ten years of telemetry data indicate, the area is used by small numbers of caribou all year. Rut, wintering, calving, and post calving activities are a matter of record. See Map 2 – Caribou Telemetry.

This population is increasing as a result of the southern lakes recovery program and as this program continues, caribou numbers in the Red Mountain area may increase. While these caribou are closed to hunting, increased level of access and associated recreational activity on the study area by the public is a management concern, including potential interference with seasonal movements and fractionalization of range.

Thin Horn Sheep (*Ovis dalli*)

Virtually nothing empirical is known about sheep in the study area. Anecdotal information from local sources can be seen on Map 4 – Traplines and Sheep Summer Range. Guy Moon (pers comm.) has observed sheep above the Teslin River on trap line # 316. Bob Hassard (pers comm.) stated that sheep in the area move around with a few possible exceptions and summer range fidelity is non existent. Mr. Hassard had not noted mineral licks for any species in the area. In 1997, one sheep was killed by a First Nations hunter (sub zone 826) near Slate Mountain.

Information gaps on thin horn sheep in the Red Mountain area include: population estimates, confirmation of winter and lambing areas, and timing and movement between seasonal ranges. More information will be collected throughout the duration of the project.

Grizzly Bear (*Ursus arctus horribilis*)

The grizzly bear is classified under COSEWIC as special concern. There is no area specific information on either grizzly or black bear. Given the available seasonal food reserves in the region and the range of habitat types (riparian wetlands to alpine) it is reasonable to expect that bears occupy the area in low to moderate densities. Craig Yakiwchuk, an outfitter in the area, stated that both species are common and he undertakes spring and fall hunts for both species.

Incidental Notes

Martha Vanheel, on her early life in the region, said that Mountain Goat were occasionally seen in the area of #1 (Map 3), and that her family would catch small dolly varden near the confluence of Iron and Sydney Creeks (Wolf Point 2). Further, larger dolly varden were caught in a small mountain lake up Iron Creek on the western side. Craig Yakiwehuk also noted that he saw salmon spring beds 1 1/2 km above the confluence of Red Mountain creek with the Boswell River. This important local knowledge will be followed up during field studies.

Personal Communications

Bahm, George. Co-holder (With Martha Vanheel) of trap line No. 314.

Carey, Jean. Sheep biologist, YT.

Florkiewicz, Rob. Southern Lakes regional biologist, YG.

McClelland, Jaimie. Caribou technician, YG.

Hassard, Bob. Outfitter in area 1970 – 1985.

Moon, Guy & Lena. Currently trapping line No. 313 and formerly No. 314.

Vanheel, Martha. Local First Nations Elder. Octogenarian.

Yakiwchuk, Craig. Present outfitter in the area – Lone Wolf Outfitting, Whitehorse, Yukon.

Ward, Rick. Moose biologist, YG.

Westover, Sue. Moose technician.

Other Resource People who were Unavailable for Interview

Smith, Philip. Former outfitter in the area.

Goodwin, Bert. Traps line No. 316.

Henry, Don. Traps line No. 312.

Whitfield, Larry. Traps line No. 311

2003 Nisutlin North Moose Survey Stratification Results

(Nov. 20 -21, Dec. 7, 10, 2003)

402 — Sample Unit Number (SU)

6052-13330 — Latitude/Longitude coordinate of SE corner of SU

Stratum Level and Moose per Sample Unit

10 — High Strata SUs - number of moose observed per SU

0 — Low Strata SUs - number of moose observed per SU

Moose Group Locations - (2003_nisutlinnorth_strat_wpts_data.shp)

Elevation within Survey Area that is 5000 ft. or greater

4 0 4 8 12 Kilometers

Albers Equal Area projection (standard parallels: 61°40'N & 68°00'N)

Higher Density Locations

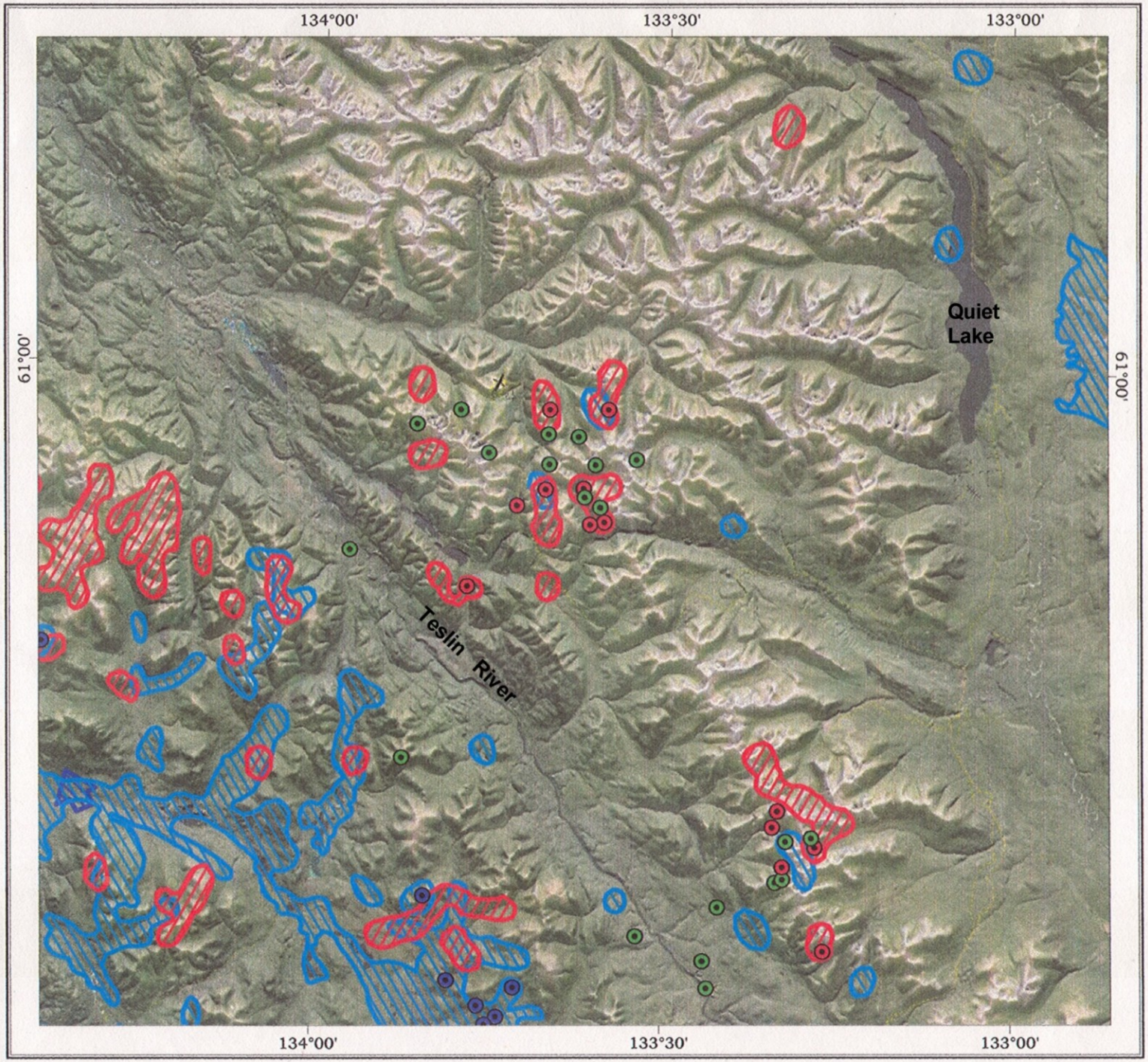
DIGITAL DATA SOURCES AND DISCLAIMERS

National Topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:250,000. Reproduced under license from Her Majesty the Queen in Right of Canada, with permission of Natural Resources Canada.

Map Compiled By:
Susan Westover
Dept. of Environment
22 March 2004

Map #1

D:\Nisutlin\MooseSurvey\AvProject\nisutlin.apr



Carcross Caribou
Known locations and Key Habitats
August 2005

Scale 1:500,000

5 0 5 10 Kilometers

Albers Equal Area projection (standard parallels: 61°40'N & 68°00'N)

Map # 2

Seasonal locations.shp
- CALVING
- EARLY WINTER
- LATE WINTER
- POST CALVING
- RUT

Carcross_lw_keyhab.shp
- Woodland Caribou (fall rutting - survey data)
- Woodland Caribou (winter range - survey data)

Map Compiled By:
Rob Florkiewicz
Department of Environment
Regional Management
Government of Yukon

19 August 2005

D:\HDrive_Files\Southern_Lakes_Region\key_habitat.apr

Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Incidental Wildlife Observations

1. Mountain Goat - Martha Vanheel
2. Dolly Varden, possibly Bull Trout - Martha Vanheel
3. Known late winter moose range, depending on snow, moose in most drainages - Guy and Lena Moon
4. King Salmon run in Swift River - Guy Moon
5. King Salmon run in Sydney Creek, Moose winter range -George Bahm
6. Salmon Redds - Craig Yakiwchuk

Data Source: Grant Lortie, Wildlife Biologist
Personal Communication

N

105F/04
105F/03
105C/13
105C/14

Boswell River
Slate Creek
Silco Creek
Red Mountain Creek
Chalco Creek
Iron Creek
Flat Creek
Twin Creek
Sidney Creek
Swift River
Teslin River
Hundred Mile Creek
1970's Exploration Trail
Canol Road
Quiet Lake
Rosy Lake
Swift Lake

Slate Mountain
Red Mountain
Sawtooth Range
Big Salmon Range
Pelly Mountains

C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18

Proposed Winter Access Route

1 2 3 4 5 6

Legend

- Road
- Secondary Road
- Trail
- Proposed Winter Access
- Contour
- Water Course
- Water Body
- Airstrip
- NTS Boundary and Number (105C/13)
- Stream Crossing
- Waterfalls

Projection: UTM Zone 8 NAD83
Units: Meters
NTS Sheets: 105C/13, 105C/14, 105F/03, 105 F/04

Incidental Wildlife Observations

Map #3

Scale: 1:135,000

0 1 2 4 6 km

ACCESS CONSULTING GROUP

Drawn by: HD/PI	Checked by: RM
Date: August 2005	

Our File: D:\Project\AllProjects\TML-05-01\gis\mxd\Baseline\Map3_IncWild.mxd

Red Mountain Project

Yukon Territory

Tintina Mines Ltd.

Wildlife Key Areas (WKA) are compiled by the Yukon Department of Environment WKA Inventory Program (2005), against 1:250,000 NTDB from various data sources. Key Areas are based on observed locations of wildlife at key times of year, not on habitat assessment. With new information, boundaries and designations of Key Areas can change and additional Key Areas can be identified. Furthermore, Key Areas are not the only sites important for wildlife. Other information sources can identify other sites important for wildlife for reasons outside the scope of the WKA Inventory Program. Updates to Key Areas occur only periodically. For the most current information, please consult with the Regional Biologist for your area of interest. If you have questions or would like to contribute to the WKA database, please contact the WKA Inventory Program (wka@gov.yk.ca).

The Yukon Wildlife Key Area Application. Copyright © 1996-2000, Habitat and Endangered Species Management, Department of Renewable Resources, Government of Yukon.

N

105E/01
105F/04
105F/03
105C/14
105C/13
105D/16
811
825
824
826
815
817
827
OC 19
OC 17
Indian River
Bull Creek
Little Bear Creek
Boswell River
Teslin River
Shelton Creek
Baker Lake
Slate Mountain
Slate Creek
Silco Creek
Red Mountain
Red Mountain Creek
Chalco Creek
Pelly Mountains
Sawtooth Range
Iron Creek
Proposed Winter Access Route
Big Salmon Range
Rosy Lake
Swift Lake
Swift River
Mount McClintock
1970's Exploration Trail
Flat Creek
Twin Creek
Sidney Creek
Hundred Mile Creek
Quiet Lake
Canol Road

Legend

- Road
- Secondary Road
- Trail
- Proposed Winter Access
- Contour
- Water Course
- Water Body
- Airstrip
- 105C/13 — NTS Boundary and Number
- Trapping Concession Boundary
- 817 — Game Management Area Boundary and Number
- OC 19 — Outfitting Concession and Number
- Study Area

Wildlife Key Areas

- Bald Eagle
- Thinhorn Sheep
- Woodland Caribou
- Waterfowl

Projection: UTM Zone 8 NAD83
Units: Meters
NTS Sheets: 105C/13, 105C/14, 105D/16, 105E/01, 105F/03, 105F/04

Wildlife Key Areas & Game Management Zones

Map #4

Scale: 1:200,000

0 1 2 4 6 8 10 km

ACCESS CONSULTING GROUP

Drawn by: HD/PI | Checked by: RM

Date: September 2005

Our File: D:\Project\AllProjects\TML-05-01\gis\mxd\Report2005\BaselineReport\Map4_Wild.mxd

Red Mountain, Yukon, Canada

Baseline Biophysical Study
Results Summary Report for
2002-2005 Data Collection Exercises

Appendix F

Heritage and Archaeology Studies

Archaeological Overview Assessment for the Red Mountain Claim Area

28 August 2005

Prepared by

Christian D. Thomas

Of

Thomas Heritage Consulting
Whitehorse, Yukon

For

Access Consulting Group
#3 Calcite Business Centre
151 Industrial Road
Whitehorse, Yukon
Canada Y1A 2V3

Contents

Figures

Introduction and Objectives

The following report is the result of a desktop heritage overview assessment for the Tintina Mines Ltd. Red Mountain Property. The study area is located in the Big Salmon/Saw Tooth Mountain ranges of the southern Yukon (Figure 1). The mine claim area is centred on Red Mountain which lies to the north of the Rose/Swift Lake chain and to the south of the Boswell River.

The objective of this report is to supply the *Tintina Mines Ltd.,* with a preliminary overview of localities in the above mentioned study area that may have elevated potential for presence of heritage values (such as historic and archaeological sites) that may be impacted by future development activities. In this case 'heritage values' refers to :

A) Heritage resources that are protected and managed as per the *Yukon Historic Resources Act* and Chapter 13 of the *Umbrella Final Agreement* (UFA). In the former heritage resources have been defined as "(i) a historic site, (ii) a historic object, and (iii) any work or assembly of works of nature or of human endeavor that is of value for its archaeological, palaeontological, pre-historic, historic, scientific, or aesthetic features"(1991). Furthermore, the management of heritage sites relating specifically to the history of Yukon First Nations is dictated in Chapter 13 of the *Umbrella Final Agreement* (UFA). The functional definitions that are useful to this report are borrowed, in part, from "Guidelines for the Management and Protection of Historic Resources for Timber Harvest Planning" (Government of Yukon 2003) and are as follows:

1. A **site** means, as the case may require, an area or a place, or; a parcel of land, or; a building or structure, or; an exterior or interior portion or segment of a building or structure**.**
2. **Historic Sites** are cabins, caches, graves, brush camps, transportation features and any other man-made structures, features or objects that have been abandoned and are of greater than 50 years in antiquity but generally post date the initial period of contact between Europeans and indigenous First Nations people.
3. **Archaeological sites** tend to date to before European contact and are found on or under the ground surface, and generally consist of the remains of ancient camps, hearths and stone tools and debris.
4. **Palaeontological resources** are fossil and other remains of extinct or prehistoric plants and animals.

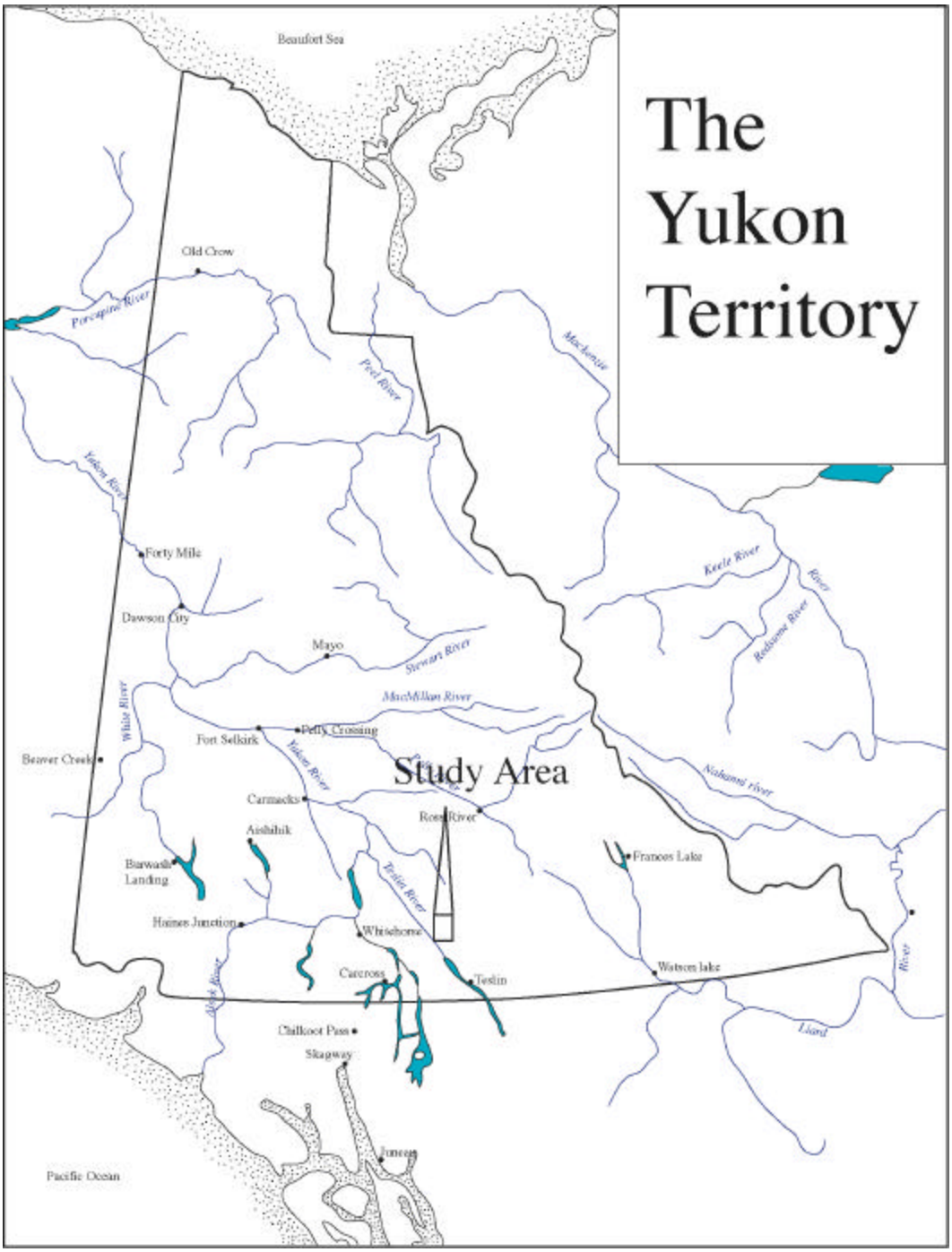


Figure 1: Map of the Yukon highlighting the study area.

B) Burial sites are not defined here as a heritage "resources" or "sites" though they are afforded similar measures of protection under *Historic Resources Act* and the *Umbrella Final Agreement*. The definitions of what burial site/s are comes from the "Guidelines Respecting the Discovery of Human Remains and First Nation Burial Sites in the Yukon:"

1. A **burial site** is the location of any human grave or remains that have been interred, cremated or otherwise placed, and includes ossuaries, single burials, multiple burials; rock cairns; cave or cache burials etc. not situated within a cemetery.
2. A **First Nation burial** is a place outside a recognized cemetery where the remains of a cultural ancestor of a Yukon First Nations person have been interred, cremated or otherwise placed.
3. **Human remains** mean the remains of a dead human body and include partial skeletons, bones, cremated remains and complete human bodies that are found outside a recognized cemetery.
4. A **grave offering** is any object or objects associated with the human remains which may reflect the religious practices, customs or belief system of the interred.
5. A **recognized cemetery** is a defined area of land that is set aside for the burial of human remains.

Where areas have been deemed to have elevated potential, heritage management / conservation strategies will be recommended. The recommendations outlined in this report are not based on the results of a field survey or traditional land use studies, but rather, the interpretation of orthographic photos, topographic maps and published literature research. Local First Nations groups/organizations (Teslin Tlingit Council) were not consulted for this portion of the heritage assessment. Teslin Tlingit Council will be involved during the impact assessment stage of the study.

Methodology

The principal method employed in the present project is the detailed study of orthographic photos and topographic maps in order to identify geographic landforms that appear to be preferable for human habitation based on known archaeological site distributions and ethnographically documented land use patterns. This method involves studying orthographic photos using a stereoscope to observe prominent topographic features. In this instance the researcher is looking for prominent hills and terraces overlooking significant water bodies, wetlands or game habitat (Table 1); these types of localities tend to be focal land types for human occupation and land use and may have developed an archaeological horizon through short term or long term use. Orthographic photo coverage of the Red Mountain area and access corridor was available at 1:20,000 and 1:40,000 scale.

Background

Historic Context

Archaeological phases of the southern Yukon that apply to the study area are as follows. The earliest cultural occupation of the region likely followed the retreat of the Cordilleran ice masses at the end of the Wisconsin glacial event. The oldest of these cultures is known as the Northern Cordilleran tradition and is characterized by sites older than 7,000 to 8,000 years old (Clark 1983; Hare 1995). One site located near Beaver Creek has dated to as early as 10,670 radiocarbon years before the present (Heffner 2002). This

archaeological culture is thought to pre-date the introduction microlithic technology from Alaska into the interior of the central and southern Yukon (Clark 1983; Hare 1995).

The Little Arm phase culture dates from 7,000 to 5,000 years ago and is heralded by the appearance of microlithic technologies that appear to have diffused into the area from the interior of Alaska to the west (Clark and Gotthardt 1999; Workman 1978). During the Taye Lake phase, after 5,000 years BP, microblade technology becomes sparse if not absent in Yukon, being replaced by a technology characterized by notched projectile points and a diverse variety of scraping and carving tools (Hare 1995; Workman 1978). The latest archaeological culture identified in the southern Yukon is that of the Aishihik phase (Workman 1978). This phase is thought to be a cultural development from the earlier Taye Lake culture (ibid.) though there are some differences in technology. The most notable technological advance made during the Aishihik phase was the introduction of the bow and arrow, which replaced a type of throwing spear known as an atlatl (Hare, et al. 2004). All Aishihik phase sites are found stratigraphically above a layer of White River Volcanic Tephra that is dated to about 1,250 radiocarbon years BP (Clague, et al. 1995).

It is not known to what degree all of the aforementioned archaeological cultures represent developments or advances within a single culture. It can be stated that there are geographical commonalities in the locations of archaeological sites from different eras. A number of archaeological sites have multiple occupations spanning thousands of years suggesting that there is some form of cultural relatedness spanning many millennia of the Holocene. Certainly, the later archaeological cultures such as Taye Lake and Aishihik are the ancestors of modern First Nations people in the area.

The indigenous inhabitants of the study area are the Inland Tlingit people and are represented, at present, by the Teslin Tlingit Council. They trace their ancestry to Tlingit people who migrated inland through the Taku River from Alaskan coast over the last five centuries. Many Inland Tlingit trace their lineage to the Juneau/Auk Bay area. Though strong social and economic ties were maintained with the coastal Tlingit, inland people adopted an interior lifestyle that involved some seasonal migrations between semi-permanent villages and traditional resource areas (McClellan 1975, 1987).

The traditional economy of the Inland Tlingit was dictated by seasonal cycles; during the mid to late summer, salmon was harvested in the Teslin River and smaller spawning streams. During the late summer early fall large game were in prime condition at which time people would organize major hunting expeditions in the mountains. With the onset of winter people would settle in semi-permanent village sites at good winter fishing lakes. Winter activities included lake fishing, hunting, trapping, and trade good production. Trading was an important element of the Tlingit social universe and people continued to either travel to the coast to trade fur harvests, or they would act as trade middlemen to the Athapaskan groups of the interior (McClellan *ibid.*).

The Teslin people are thought to have begun arriving in the area some 300 to 500 years ago. Although they first entered the Yukon as traders who headquartered on the coast, the

Tlingit people eventually began to intermarry and settle in the area on a more permanent basis in the mid-19th century. They brought with them their language, clan systems and cultural practices. Many of the surrounding Athapaskan-speaking groups today have adopted variations of these cultural influences (McClellan *ibid*.).

Overview Assessment

Identification of Heritage Potential

The overall potential for the presence of heritage sites in the study area is quite low. Subalpine and alpine environs are usually occupied by people in short-term events such as during a hunting expedition, therefore, archaeological sites rarely form. As well, low sedimentation rates in the mountains are not conducive to preserving the artifacts that are deposited. Recent surveys of high alpine ice patches in the southern Yukon have shown that the majority of artifacts being used in the high alpine are indeed organic tools made from wood, bone and sinew. These types of artifacts are only known to have survived in areas where they have been deposited in ice. The consultant did not see any evidence that high alpine ice patches were present on the Red Mountain property; this fact greatly reduces the areas overall heritage potential. However, several site-specific localities that appear to have elevated potential relative to the remainder of the study area have been identified through ortho-photo interpretation. These localities are located on elevated terraces and hills overlooking lakes, ponds and water drainages. The consultant feels these localities could have been used as short-term hunting camps and lookout sites during late summer and fall hunting expeditions into the mountains.

Several creeks and rivers flow through the study area and it is possible that these were used as spring grayling sites. It should be noted that fish sampling studies presently being completed in relation to the mining development assessment process have shown that fish are not present in the upper reaches of the Boswell River as well as several other small drainages flowing from the alpine regions of the property. The absence or low quality of fish resources in the study area is a major factor in reducing the overall heritage site potential for the area.

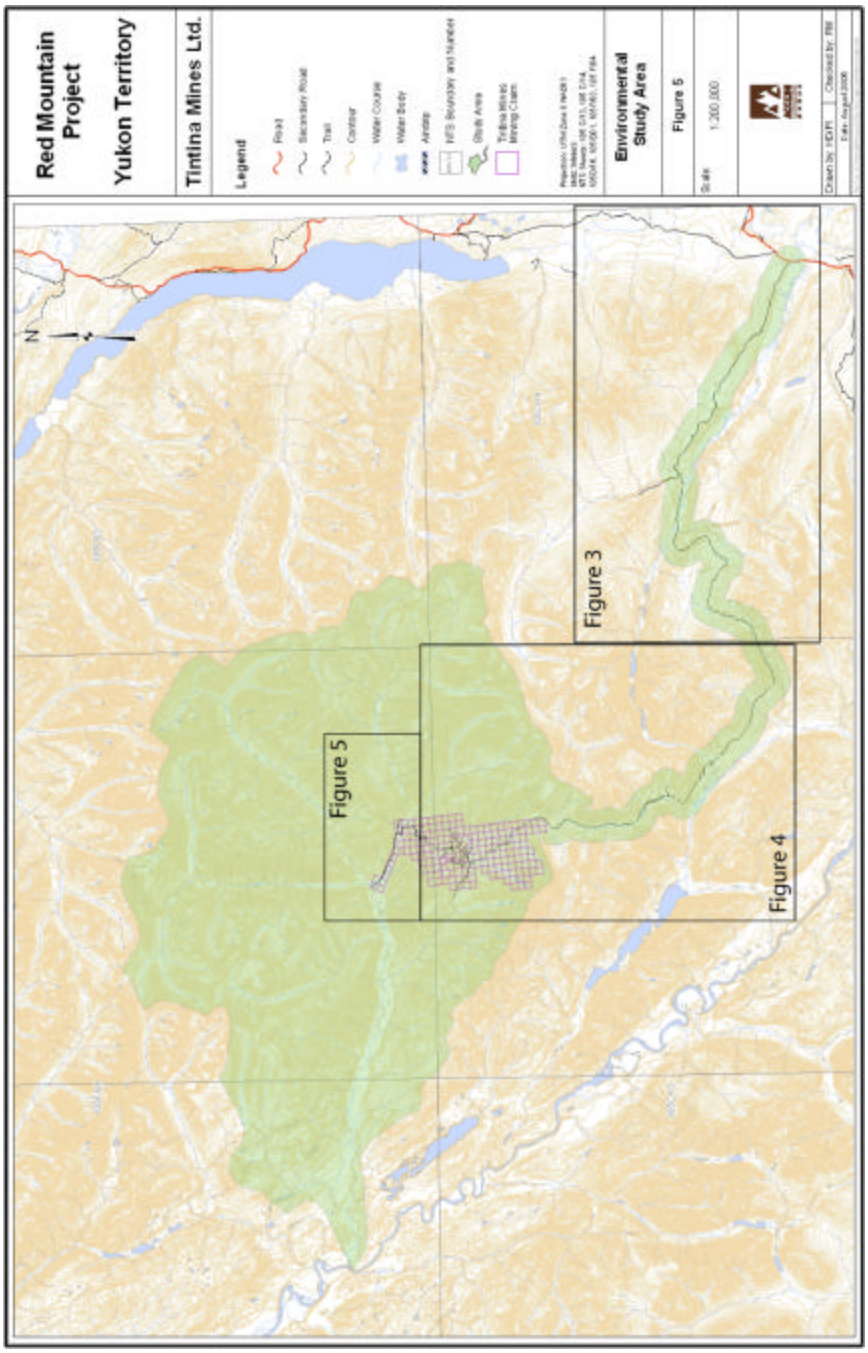


Figure 2: Map of the development area

The following localities have been highlighted as having elevated heritage potential. Areas marked in green have low potential for site presence and require no further work, areas in yellow have moderate potential for site presence and areas marked red have the highest potential for site presence.

Map Sheet 105C/14:

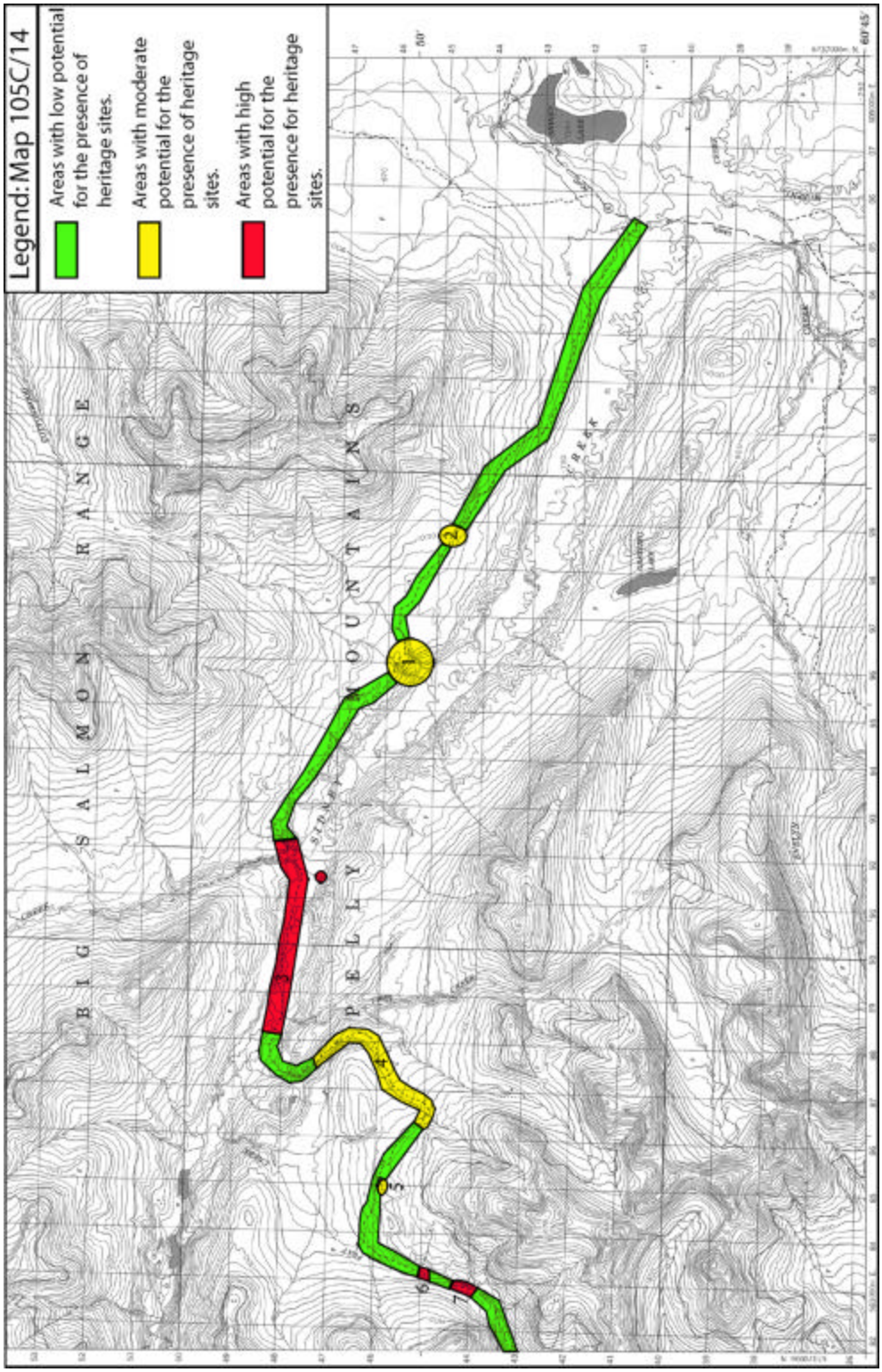


Figure 3: Map sheet 105C/14 showing highlighted areas with heritage potential.

Locality Notes for Map Sheet 105C/14:

1) The road passes close to the edge of a prominent terrace with a good lookout. The road crosses two streams at this point. Subsurface shovel testing should be completed at the stream crossings.
2) Presence of a lone hill with a seemingly good view of the surrounding plateau. The location should be spot-checked. A visual scan of the roadside exposures will confirm or negate the presence of a site.
3) At this point the road comes down off of the hill slope on to the terrace edge and then down to valley bottom. There are multiple south facing terrace edge lookouts that should be tested. In the valley bottom there are multiple south facing portions of flood plain low terrace in close proximity to Sidney Creek. Exposures in road cut should be checked in valley bottom. Judgmental subsurface testing to be completed in areas where road is to be widened or rerouted. Stream crossings should be tested (Three noted in this section).
4) A three km section of road that follows an elevated terrace overlooking the southeast side of south fork of Sidney Creek at its headwaters. Exposures in the road should be scanned for artifacts. Testing should be completed at the stream crossing near headwaters of Sidney Creek.
5) A low hill to the south side of the road that has moderate potential for the presence of a lookout site. There is no need to test this locality unless the road is rerouted in such a way as to impact the site.
6) The road crosses a small stream. The stream flows into the valley from the east and is fed by a small pond/lake about one km up a valley leading into the mountains. Potential source of drinking water for travelers. Should test at stream outlet and at point where the road does or will cross the stream.
7) A small pond/lake is present in the middle of the valley. This locality could be a potential camp site/fishing site/trapping site. The west side of the lake should be tested where the road comes within 100 m of the lakeshore.

Map Sheet 105C/13

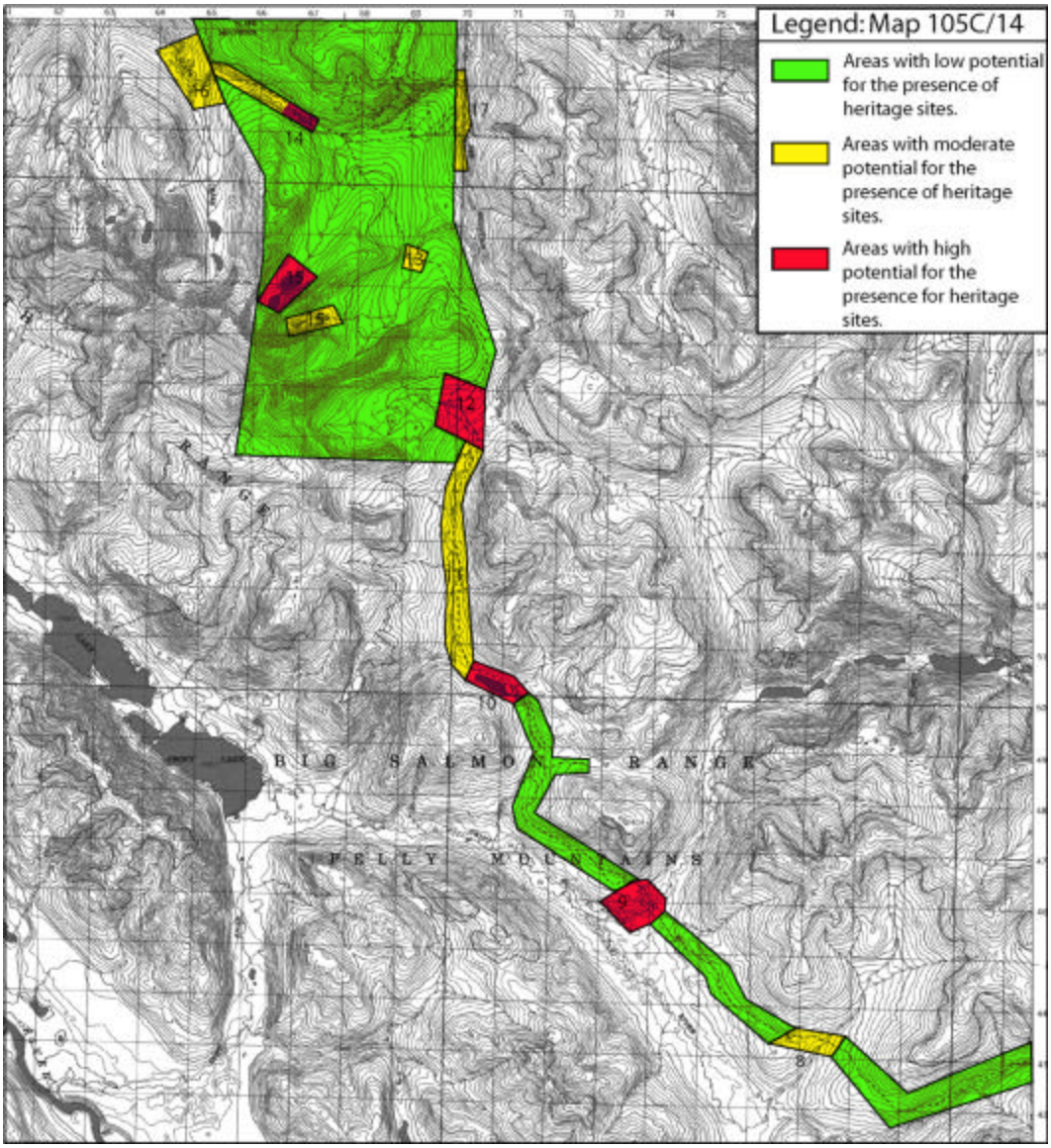


Figure 4: Map sheet 105C/13 showing highlighted areas with heritage potential.

Locality Notes for Map Sheet 105C/13:

8) The road crosses a mountain stream, then passes along the north side of a pond/small lake roughly 1 km to the west of stream crossing. Road cut exposures should be checked and judgmental subsurface testing should be completed at both sites.
9) The road crosses a stream with a prominent elevated hill/terrace that would be a preferable camp location. Exposures should be checked and testing should be completed on both the east and west sides of the stream crossing.
10) The road passes to the north of a significant lake. The road does not appear to cross a particularly high potential landform (hill/terrace/narrows/inlet/outlet). However, roadside exposures should be checked and the area potential should be

reassessed on site and judgmental subsurface testing should be completed as per reassessment.

11) The road follows the east side of a north/south oriented creek valley. Poor Orthographic photo coverage for this section does not allow me to judge the roads proximity to the stream or existing moderate potential landform features. This section of road should be visually surveyed and judgmentally tested it elevated potential can be reassessed upon site visit. Attention should be given to stream crossings and elevated hills and terraces that are within 100 m of the road.
12) The road crosses the stream in two spots at what appears to be a convergence of three small valleys. Several elevated hills are present in the area. It cannot be judged at present whether or not the road passes over any of these features. Exposures should be checked and testing should be completed on the hilltops near the road corridor.
13) The road crosses a minor stream. Exposures should be checked. No other high potential landform associated with this stream.
14) A small pond in the high alpine cirque of a mountain peak. The pond is within claim area and should be shovel tested before major development begins (such as mining, camp development or other).
15) Small alpine lakes (Likely kettle/kame feature) within the major claim area. There is relatively high potential for site presence and the localities should be subsurface tested prior to major development activity.
16) Linear ridge overlooking a small stream. Possible hunting lookouts sites may be located on the ridge. Moderate to low potential.
17) There are portions of western and eastern bank of Red Mountain Creek with a well-defined ridgeline. The site-specific potential should be reassessed on the ground. Otherwise the area should be judgmentally shovel tested pending the nature of the development.

Map Sheet 105F/04

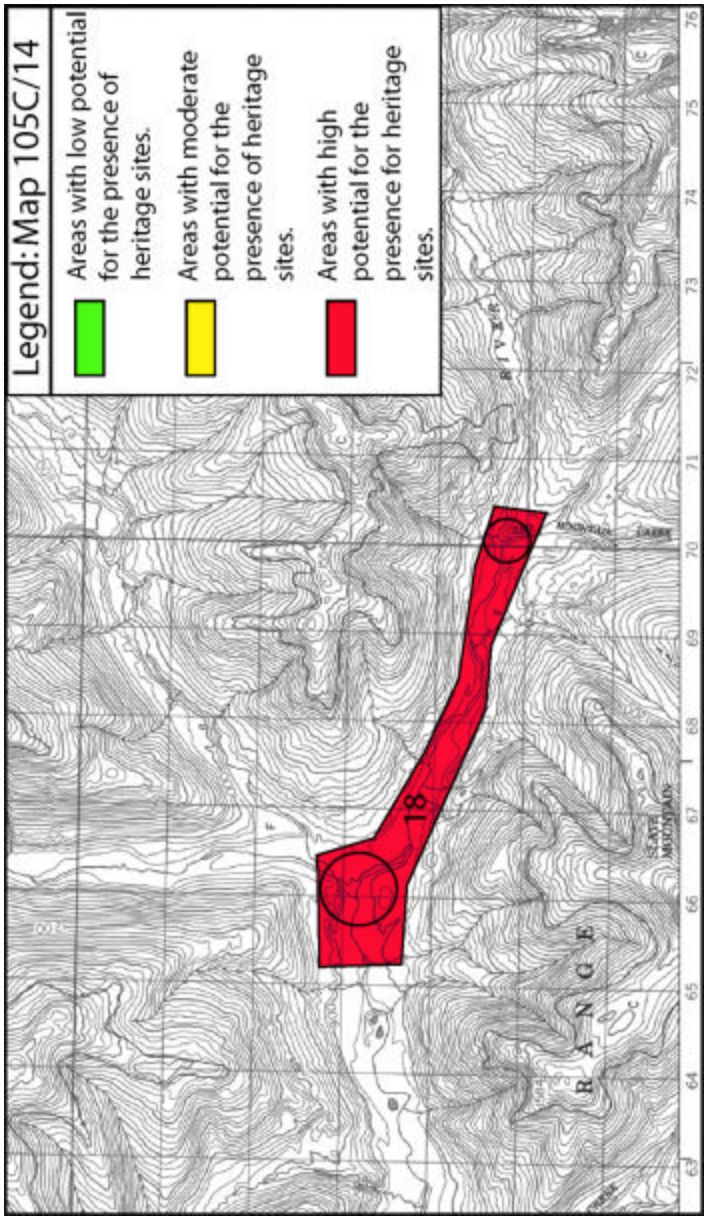


Figure 5: Map sheet 105F/04 showing highlighted areas with heritage potential.

Locality Notes for Map Sheet 105F/04:

18) Boswell River Valley section. Highest potential in the area appears to be at the former's confluence with Red Mountain Creek and an unnamed creek flowing into the valley from the north that is located roughly 4 km west of Red Mountain Creek (black circles). Both confluences have a number of well-defined terraces near the current river channel. Orthographic photos suggest the presence of paleo-river channels that are considered have similarly high archaeological potential. The section of the Boswell River valley that lies in the highlighted red area should be tested pending the nature of the developments that are planned for the area.

Recommendations

The consultant recommends that the developer should conduct a heritage site inventory and impact assessment at the highlighted localities before the site access road is reopened. Areas highlighted in green have little or no heritage potential and no further work is recommended in advance of the development. In many cases the highlighted sections of the development area are on elevated hills and terraces in the access road corridor. Should the consultant not be able to access these areas before construction begins, then the consultant recommends that the roadway not be widened or realigned in areas where elevated potential has been assessed. These areas could then be subject to a post development impact assessment once the areas are accessible by road.

Regarding the claim area, it is recommended that the highlighted localities be assessed in advance of mining developments and the construction of related facilities. There are three sites on the south side of the Boswell River that may be impacted by significant exploration developments such as adit excavation and related access points. These areas should be visited and assessed in advance of the exploration work.

At present, a two to three day site visit is scheduled for 6-8 September. During this time the consultant will field check all of the highlighted localities to 1) reconfirm the heritage potential, and; 2) undertake heritage inventories and impact assessments in areas that will be affected by developments scheduled for the fall and winter season. These areas include the road corridor and the potential adit sites in the Boswell River valley. Furthermore, the consultant is currently querying the lands department at Teslin Tlingit Council with the purpose to developing a map of known First Nation heritage sites in the area. The consultant will also be assessing the nature of on going traditional land use in the area. The results of these activities will be published in future reports.

References

Government of Yukon
1991 Historic Resources Act.

Clague, J. J., S. G. Evans, V. N. Rampton and G. J. Woodsworth
1995 Improved age estimates for the White River and Bridge River tephras, western Canada. *Canadian Journal of Earth Science* 32(8):1172-1179.

Clark, D. W.
1983 Is there a Northern Cordilleran Tradition? *Canadian Journal of Archaeology* 7(1):23-48.

Clark, D. W. and R. M. Gotthardt
1999 Microblade complexes and traditions in the interior northwest, as seen from the Kelly Creek site, west-central Yukon. *Heritage Branch Government of the Yukon Hude Hudän Series, Occasional Papers in Archaeology* No. 6.

Government of Yukon, C. S. B.
2003 Guidelines for the Management and Protection of Historic Resources for Timber Harvest Planning, edited by R. Gotthardt.

Yukon Ecoregions Working Group
2004 Klondike Plateau. In *Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes*, edited by C. A. S. Smith, J. C. Meikle and C. F. Roots, pp. 159-168. vol. PARC Technical Bulletin No. 04-01. Agriculture and Agri-Food Canada, Summerland, British Columbia.

Hare, G., S. C. Greer, R. Gotthardt, R. S. Farnell, C. E. Schweger and D. Strand
2004 Ethnographic and archaeological investigations of alpine ice patches in southwest Yukon, Canada. *Arctic* 57(3):260-272.

Hare, P. G.
1995 Holocene occupations in the southern Yukon: New perspectives from the Annie Lake site. *Heritage Branch Government of the Yukon Hude Hudän Series, Occasional Papers in Archaeology* No. 5.

Heffner, T. A.
2002 KaVn-2: An Eastern Beringian Tradition archaeological site in west-central Yukon Territory, Canada. *Heritage Branch Government of the Yukon Hude Hudän Series, Occasional Papers in Archaeology* No. 10.

McClellan, C.
1975 My old people say: An ethnographic survey of southern Yukon Territory, Parts 1 & 2. *Mercury Series Publications in Ethnology Paper* No. 137.

1987 *Part of the land, part of the water*. Douglas & McIntyre, Vancouver.

Workman, W. B.
1978 Prehistory of the Aishihik-Kluane area, southwest Yukon Territory. *National Museum of Man Mercury Series, Archaeological Survey of Canada Paper* No. 74.