

YUKON WATER BOARD

Pursuant to the Waters Act and Waters Regulation, the Yukon Water Board hereby grants a Type B water licence for a quartz mining undertaking to:

Aurchem Exploration Ltd.
Box 13
Whitehorse, YT Y1A 5X9

LICENCE NUMBER: QZ06-073
LICENCE TYPE: B **UNDERTAKING:** QUARTZ MINING
LOCATION: Mount Victoria Region
PURPOSE: To obtain water for the purpose of milling and to deposit a waste.
EFFECTIVE DATE: The effective date of this Licence shall be the date on which the signature of the Chairperson of the Yukon Water Board is affixed.
EXPIRY DATE: December 31, 2012

This Licence shall be subject to the restrictions and conditions contained herein and to the restrictions and conditions contained in the Waters Act and the Waters Regulation made thereunder.

Dated this 20th day of

Approved by:

April, 2007.

Original signed by witness

Original signed by Chair

Witness

Chairperson
YUKON WATER BOARD

PART A - DEFINITIONS

“Act” means Waters Act and any amendments thereto.

“Application” means Water Use Application QZ06-073, including any additional submissions and/or revisions submitted to the Yukon Water Board by the Licensee, up to the date of the Board’s decision.

“Board” means the Yukon Water Board.

"Inspector" means any person designated as an Inspector under the Act.

"Natural Boundary" means the visible high water mark of any lake, river, stream or other body of water where the presence and action of water is so common and usual and so long continued as to mark upon the soil of the bed of the lake, river, stream or other body of water a character distinct from that of the banks thereof, both in respect to vegetation and in respect to the nature of the soil itself. In addition, the best estimates of the edge of dormant or old side channels and marsh areas are considered to be Natural Boundaries.

“Regulation” means the Waters Regulation made under the Act.

“Waste” means any substance as defined in Section 1 of the Act.

“Watercourse” means any stream, lake, pond, river, creek, spring, ravine or swamp whether ordinarily containing water or not.

“Wetted Perimeter” means the horizontal extent of the present water level while the work is taking place.

PART B - GENERAL CONDITIONS

Representations, Warranties and Undertakings

1. The Board has relied on the representations, warranties and undertakings provided by the applicant in the material filed in the Application. Such representations, warranties and undertakings are considered by the Board to be a part of the licence but shall be subject to, and may be modified by, the conditions of the licence.

Other Laws

2. No condition of this licence limits the application of any other federal, territorial, first nation or municipal legislation.

Correspondence

3. Where any direction, notice, order or report under this licence is required to be in writing, it shall be given:

- a) To the Licensee, if delivered or mailed by registered mail to the following address:

Aurchem Exploration Ltd.
Box 13
Whitehorse, YT Y1A 5X9

and shall be deemed to have been given to the Licensee on the day it was delivered or 7 days after the day it was mailed, as the case may be.

- b) To the Board, if delivered, faxed or mailed by registered mail to the following address:

Yukon Water Board
Suite 106, 419 Range Road
Whitehorse, YT Y1A 3V1

Fax: 867 456 3890

and shall be deemed to have been given to the Board on the day it was delivered or faxed, or 7 days after the day it was mailed, as the case may be.

- c) The Board or the Licensee may, by notice in writing, change its address for delivery.

Non-Compliance

4. In the event that the Licensee fails to comply with any provision or condition of this licence, the Board may, subject to the Act, cancel the licence.

Other Uses

5. If, subsequent to the issuing of this licence, the Licensee uses water and/or deposits Waste in one or more ways not authorized in this licence, and the combined effect of those uses and/or deposits of Wastes, as determined by an Inspector:

- a) has no potential for significant adverse environmental effects; and
b) does not interfere with existing rights of other water users or Waste depositors;
and
c) satisfies the criteria set out in column 2 of Schedule 7 of the Regulation,

no amendment to this licence will be required for that use of water and/or deposit of Waste.

Spills and Unauthorized Discharges

6. The Licensee shall immediately contact the 24-hour Yukon Spill Report number, 867 667 7244, and implement the spill contingency plan should a spill or an unauthorized discharge occur. A detailed written report on any such event including, but not limited to, dates, quantities, parameters, causes and other relevant details and explanations, shall be submitted to the Board not later than 10 days after the occurrence.
7. All personnel shall be trained in procedures to be followed and the equipment to be used in the containment of a spill.
8. The spill contingency plan shall be posted on site for the duration of the works.

Annual Reports

9. On or before the anniversary of the date of issuance of this licence, and for each year during which this licence is in effect, the Licensee shall submit an annual report to the Board. The report shall include the information required by the Regulation including, but not necessarily limited to:
 - a) a description of the activities carried out during the year reported,
 - b) the quantity of water used daily, during operation,
 - c) the quantity of ore processed daily during operation of the mill,
 - d) all monitoring data required to be collected by this licence,
 - e) any reclamation to the site, and
 - f) a report on all activities carried out during the preceding year as part of any study required by this licence.

Reports

10. Unless otherwise specified in this licence, all reports shall be submitted to the Board in an unbound form that is reproducible by standard photocopier and shall be accompanied by 5 copies.
11. All reports shall be submitted in digital form on computer diskette using an IBM compatible format that is readable using commonly available software.

Term of Licence

12. The term of this licence is for the period from the effective date to December 31, 2012.

PART C - OPERATING CONDITIONSDescription of Water Use

13. The Licensee is hereby authorized to:
- a) obtain water from existing trenches up to a maximum quantity of 300 m³/d for the purpose of mill use and settling pools; and
 - b) construct an open-pit mine and operate a mill at a maximum rate of 50 tonnes of ore per day to a maximum of 5,000 tonnes of ore per year and a maximum of 20,000 tonnes of ore during the term of the license for the purpose of a quartz mining undertaking; and
 - c) construct earthworks and erosion protection,
- all as described in the Application, and subject to the conditions of this licence.

Description of Waste Deposit

14. The Licensee is hereby authorized to deposit a waste as follows:
- a) Waste in the form of discharge water contained within the tailings;
 - b) during seasonal closure, wastewater from the tailings pools shall be discharged to the existing trenches,
- all as described in the Application, and subject to the conditions of this licence.
15. Where there is a discrepancy between the Application and this licence, the conditions of this licence shall prevail.

Notification

16. Notification, including the name and phone number of the field supervisor, shall be provided to the Board, in writing, 10 days prior to the start of construction.

PART D – DESIGN, CONSTRUCTION AND OPERATION

17. All construction or installation of works authorized by this licence shall occur on property that the Licensee has the right to enter upon and use for that purpose.
18. Equipment shall be mechanically sound and free of leaks.
19. Fuel, lubricants, hydraulic fluids, mill reagents, coolants and similar substances shall be stored and/or transferred a minimum of 30 metres from the Natural Boundary of any Watercourse, in such a way that said substances are not deposited in or allowed to be deposited in waters.

20. No heavy equipment shall be operated within the Wetted Perimeter of the any Watercourse.
21. Waste substances shall be used, transported, stored or disposed of in such a manner that they are not deposited, or allowed to be deposited, into any Watercourse or on any surrounding land.
22. All disturbed ground surfaces shall be stabilized in such a manner so as to prevent erosion and surface runoff from carrying sediment into any Watercourse.
23. A detailed site layout showing the area to be excavated, the existing trenches, mill and associated structures, fuel/hazardous materials storage area and the waste rock, ore and tailings storage areas shall be submitted to the Board no less than 30 days prior to the commencement of operations.

Tailings Settling Pools

24. No less than 30 days prior to commencement of operations, the Licensee shall submit final detailed design drawings for the construction of the tailings settling pools, including specifications for liners and a containment berm for each pool. The design drawings shall be sealed by a Professional Engineer, licenced to practice in Yukon.

Temporary Rock Storage Areas

25. No less than 30 days prior to commencement of operations, the Licensee shall submit final detailed design drawings and a site assessment report for the temporary rock storage areas, to the Board. The report shall be sealed by a Professional Engineer, licenced to practice in Yukon and shall include but not be limited to:
 - a) location and dimensions,
 - b) volumetric and tonnage capacity,
 - c) characterization of the foundation soils for permeability, permafrost and thaw stability of permafrost,
 - d) characterization of the sections through the rock storage area, clearly indicating side slopes, top contouring, cover material and thickness of components,
 - e) details for the base of the rock storage areas including permeability of the base, use of liners and detailed specifications of liners, liner bedding and cover for the liners,
 - f) characterization of any materials to be used as a cover for the rock pile including geochemical stability, freeze thaw and slaking stability, compacted permeability and details of compaction required,
 - g) procedures for placement of rock in the temporary storage areas and plans for the segregation of rock types based on acid rock drainage potential.

26. Prior to the commencement of excavation operations the temporary rock storage area shall be constructed, in accordance with the final detailed design drawings and site assessment report required by this licence.
27. During construction, where site conditions require minor design modifications, the Licensee shall notify the Board, in advance of implementation, of the details of any modifications or variations from the details site layout, design drawings, specifications and quality assurance/quality control procedures previously submitted to the Board. The notification shall include an explanation of the reasons for the change and an assessment of the potential impact. The notification shall be sealed by a Professional Engineer licensed to practice in Yukon.
28. As constructed (record) drawings and construction reports for all structures and facilities shall be submitted to the Board within 90 days of the completion of construction. Each submission shall be sealed by a Professional Engineer licensed to practice in Yukon.

Waste Rock

29. All waste rock and tailings that are potentially acid generating shall be relocated and stored in a lined rock storage area.

Maintenance

30. During the term of this licence, including any period of temporary closure, the Licensee shall maintain all works in good order in accordance with sound engineering and environmental practices.

PART E - EFFLUENT QUALITY STANDARDS

31. The points of compliance for effluent quality standards required by condition 32 of this licence shall be:
 - a) discharge in the form of seepage from the rock storage areas, and
 - b) from the final settling pools, prior to seasonal discharge to the existing trenches.

32. No waste discharge shall exceed the following limits:

Parameter	Maximum Concentration (measured in mg/L)
Arsenic (total)	0.50 mg/L
Cadmium (total)	0.02 mg/L
Copper (total)	0.30 mg/L
Lead (total)	0.20 mg/L
Nickel (total)	0.50 mg/L
Ammonia (as total N)	2.50 mg/L
Zinc (total)	0.50 mg/L
Selenium (total)	0.015 mg/L
Total Suspended Solids (TSS)	15.0 mg/L

PART F – MONITORING AND SURVEILLANCE

33. The Licensee shall compile data relating to the Surveillance Network Program into a monthly report. The report shall be submitted to the Board within 30 days of the end of each month for which the report is compiled.
34. a) The Licensee shall comply with the Surveillance Network Program attached as Appendix A to this licence.
- b) Monitoring and sampling shall be carried out in accordance with the procedures and standards described in:
- i) Guidance Document for the Sampling and Analysis of Metal Mining Effluents, April 2001, (Report: EPS2/MM/5), Minerals and Metals Division, Environment Canada.
 - ii) Guidance Document for Flow Measurement of Metal Mining Effluents, April 2001, (Report: EPS 2/MM/4), Minerals and Metals Division, Environment Canada.
 - iii) Standard Guide for Sampling Ground-Water Monitoring Wells, ASTM D4448-01, ASTM International, PA, USA.

PART G – PLANSRock Monitoring and Testing Plan

35. No less than 30 days prior to commencement of excavation of an open-pit for the purpose of quartz mining, the Licensee shall submit to the Board, a detailed rock monitoring and testing plan describing the procedures to be used for sampling and testing the geochemical characteristics of rocks encountered during excavation. The plan shall include, but not necessarily be limited to:
- a) plans for the sampling of each rock type encountered including size and number of samples,
 - b) plans for assessing the physical characteristics of each rock type including petrographic and hand specimen descriptions, mineralogical analysis, freeze thaw stability, and grain size characterization,
 - c) plans for geochemical characterization of each rock type including whole rock and trace element chemistry,
 - d) protocol for shake flask testing of each rock type,
 - e) plans for assessing acid rock drainage or metal leaching characteristics of the rock types including static and kinetic test protocols and duration and plans for analysis of the test data,
 - f) details of any decision making protocol involving segregation of rock materials in the storage area.
 - g) mitigation methods in the event that acid rock drainage is detected in any discharge.
36. Upon commencement of excavation, the Licensee shall implement the rock monitoring and testing plan. In the event that the plan requires revision, the Licensee shall submit a revised plan to the Board no less than 10 days after the revision including an explanation of why the revisions are necessary.

Permanent Closure Plan

37. Within one year of the commencement of operations, the Licensee shall submit a draft plan for permanent closure of the undertaking to the Board. The plan shall be for the reclamation and decommissioning of the appurtenant undertaking and is to include specific measures to be undertaken for the stabilization and restoration of the site including, but is not necessarily limited to:
- a) an updated water quality model and an assessment of impact of the closed site,
 - b) a contingency plan in the event that the wastewater in the final tailings pools or the waste rock storage seepage requires year round water treatment,
 - c) the physical and chemical stability of all components of the works during permanent closure,
 - d) a feasibility study for returning all potentially acid generating rock into the environment, including associated cost estimates,

- e) cost estimates for permanent closure based on completion by third party contractors,
 - f) final configuration of the rock storage area, if required and a plan for the return of waste rock to the open-pit,
 - g) settling pond stability, including any contained tailings, if required,
 - h) seepage and runoff collection system,
 - i) provisions for ongoing water collection and treatment to maintain discharge standards,
 - j) monitoring of discharge, receiving environment and all physical structures remaining on site,
 - k) maintenance of pools, waste rock storage areas, covers, if necessary,
 - l) a schedule for completion of the closure measures, including on going monitoring,
 - m) any reclamation or recontouring of the ground surface, and
 - n) provisions for temporary closure.
38. One year prior to the expiry date of this licence, the Licensee shall submit a final plan for permanent closure of the undertaking that includes at a minimum, the information required by this licence for the draft closure plan and a discussion of the updates that have been incorporated into the final plan.

PART H - SITE DECOMMISSIONING AND RESTORATION

39. The Licensee shall implement the Permanent Closure Plan in accordance with the schedule included in that plan.
40. Prior to the implementation of the Permanent Closure Plan, the Licensee shall provide written notification to the Board.
41. All disturbed ground surfaces shall be regraded in a manner which is consistent with the topography of the site and which prevents erosion and surface runoff from carrying sediment into any Watercourse. Where soil conditions permit, disturbed areas shall be re-vegetated with appropriate reclamation seeds and/or plants. All construction materials, equipment, temporary structures and debris shall be removed from the site.
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APPENDIX A

1. **WATER QUALITY MONITORING PROGRAM
SCHEDULE OF WATER QUALITY MONITORING SITES**

- Station 1: unnamed creek, known locally as Iron Creek, UTM Coordinates 383997E, 6892726N
- Station 2: unnamed creek, known locally as Iron Creek, UTM Coordinates 386536E, 6893585N
- Station 3: Klaza Creek, UTM Coordinates 384168E, 6890576N
- Station 4: Clarifier pond
- Station 5: Process ponds
- Station 6: Mine Pits and Active Sumps
- Station 7: Any discharge from tailings storage
- Station 8: Any discharge from waste rock storage
- Station 9: Any discharge from mine excavations

2. **SURVEILLANCE NETWORK PROGRAM**

STATION NO.	ANALYTICAL SUITE / FREQUENCY
1	IS/M ₁ , WC/Q
2	IS/M ₁ , WC/Q
3	IS/M ₁ , WC/Q
4	IS/M ₁ , LV/M ₁ , WC/Q
5	IS/M ₁ , LV/M ₁ , WC/Q
6	IS/M ₁ , LV/M ₁ , WC/Q
7	F/M ₂ , IS/M ₂ , WC/M ₂
8	F/M ₂ , IS/M ₂ , WC/M ₂
9	F/M ₂ , IS/M ₂ , WC/M ₂

Legend:

- IS: In-situ Measurements (Flow, Field pH, Field Temperature, Field Conductivity).
- WC: Water Chemistry (ICP Total Metals by Low Method Detection Limits, ICP Dissolved Metals by Low Method Detection Limits, Hardness, Total Suspended Solids, Total Dissolved Solids, Total Alkalinity, Total Sulphate, Nitrogen-Nitrate, Nitrogen-Nitrite).
- LV: Water level and volume.
- F: Flow rate.
- M₁: Monthly when operating.
- M₂: Monthly when discharging, with the first sample taken within the first week of the beginning of discharge.
- Q: Quarterly when operating, with the first sample taken during the first month of seasonal operation.