

PROPOSED WATER USE LICENCE

LICENCE NUMBER: Alexco Resource Corp.
Suite 1920-200 Granville Street
Vancouver, BC V6C 1S4

LICENCE TYPE: B
UNDERTAKING: QUARTZ MINING

LOCATION: Keno Hill Mines Property

MAP CO-ORDINATES: Minimum Northing: 7082597 Maximum Northing: 7098060
Minimum Easting: 462845 Maximum Easting: 495302
Centre Northing: 7090328 Centre Easting: 479073

PURPOSE: To obtain water, store water and to deposit a waste for the purpose of exploration and preliminary development activities for the Keno Hill Mines Property

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: 10 years from the effective date ie) July 2018

Y W B

0207-17

PART A - DEFINITIONS

“Act” means *Waters Act* and any amendments thereto.

“Adaptive Management Plan” means the Adaptive Management Plan submitted as part of Water Use Application QZ06-074 Licence Registry exhibit 1.4.3, and condition of Water Use Licence QZ06-074, Part D, Clause 22 and any subsequent revisions.

“Application” means Water Use Application QZ##-###, 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.

“Dam Safety Guidelines” means the Dam Safety Guidelines issued by the Canadian Dam Association (2007), and any subsequent revisions.

“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.

“Spill Contingency Plan” means the Emergency Response Guide that was submitted as part of the Application and included in Water Use Register QZ##-###, and any subsequent revisions.

“Waste” means any substance as defined in 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.

Y W B

8

QZ06-074

PART B - GENERAL CONDITIONS

Representations, Warranties and Undertakings

1. In this licence, the Board has relied on the representations, warranties and undertakings provided by the Licensee in the material filed in the Application.
2. Where there is a discrepancy between the Application and this licence, the conditions of this licence shall prevail.

Other Laws

3. No condition of this licence limits the application of any other federal, territorial, first nation or municipal legislation.
4. 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.

Correspondence

5. 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, faxed or mailed by registered mail to the following address:

Alexco Resource Corp.
Suite 1920-200 Granville Street
Vancouver, BC V6C 1S4
Fax: 604 633 4887

and shall be deemed to have been given to the Licensee on the day it was delivered or faxed, 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.

Y W B

8

0207-278

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

Non-Compliance

- 6. 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

- 7. 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

- 8. 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.
- 9. All personnel shall be trained in procedures to be followed and the equipment to be used in the containment of a spill.
- 10. Ten days prior to construction, the Licensee shall submit material safety data sheets to the Board for all petroleum products and/or hazardous materials that are to be present during this undertaking.
- 11. The spill contingency plan shall be posted on site for the term of the licence.

Fuel Storage and Transfer

- 12. Fuel, lubricants, hydraulic fluids, 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.

Y W D

8

0207-170

Waste Substances

13. 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.

Annual Reports

14. Annual reports shall be submitted to the Board by the Licensee. The first report shall be for the period from the effective date of the licence to December 31, 2008. Subsequent reports shall be for each calendar year. Annual reports will be submitted to the Board on or before February 28 of the following year.
15. Annual reports shall include the information required by the Regulation, including, but not necessarily limited to:
 - a) a description of the water use operations carried out during the year reported; and
 - b) the quantity of water used each day; and
 - c) a detailed record of any major maintenance work carried out or planned to be carried out that could have an impact on water; and
 - d) summaries of all data generated as a result of the monitoring requirements of this licence, including analysis and interpretation by a qualified individual or firm and a discussion of any variances from baseline conditions or from previous years' data; and
 - e) details of any work carried out or planned to be carried out under the Adaptive Management Plan.

Monthly Reports

16. Unless otherwise specified in this licence, the Licensee shall forward to the Board a copy of all data collected as part of the monitoring programs of this licence no more than 30 days after the conclusion of the month in which that data was collected.

Reports

17. Unless otherwise specified in this licence, all monitoring data, reports, plans, studies, study results, designs or manuals shall be submitted to the Board in an unbound form that is reproducible by standard photocopier and shall be accompanied by 5 copies.
18. All monitoring data, reports, plans studies, study results, designs or manuals shall be submitted in digital form on computer diskette using an IBM compatible format that is readable using commonly available software.

Y W B

8

0287-077

Term of Licence

19. The term of this licence is for the period from the effective date to July 30, 2018.

PART C - OPERATING CONDITIONS

Description of Water Use and Deposit of Waste

20. The Licensee is hereby authorized to:
- a) obtain and use water for a quartz mining undertaking at a rate not exceeding a total of 71 m³/day from Thunder Gulch, Lightning Creek, as well as treated wastewater from the Bellekeno 625 and Bellekeno East settling ponds and underground waters from the Bellekeno mine;
 - b) obtain and use water for camp purposes at a rate not exceeding a total of 29 m³/day from Flat Creek and the proposed groundwater supply well;
 - c) store water in settling ponds at the Bellekeno East portal;
 - d) operate existing wastewater treatment system and store water in settling ponds at the Bellekeno 625 adit;
 - e) deposit waste to Thunder Gulch and Lightning Creek in the form of wastewater that has been treated to meet the discharge standards required by this licence from settling ponds located at Bellekeno 625 and Bellekeno East;
 - f) deposit waste to ground in the form of camp wastewater that has been treated in a septic treatment system;
 - g) deposit waste in the form of sludge; and
 - h) construct earthworks and erosion protection,

as described in the Application, and subject to the conditions of this licence.

PART D – PLANS

21. The Licensee shall submit any revisions to the Adaptive Management Plan for the Keno Hill Mines Property to the Board resulting from the advanced exploration and development activities to the Board. A summary of activities carried out under the plan shall be submitted to the Board as part of the annual report.
22. Subject to any required assessments, authorizations or approvals, the Licensee shall implement all plans required by this section of this licence.

Y W B

8

0200-111

PART E – EFFLUENT QUALITY STANDARDS

25. No Waste discharged from the wastewater treatment systems at Bellekeno 625 adit and Bellekeno East decline shall exceed the following limits:

Parameter	Maximum Concentration in a Grab Sample Measured in mg/L
pH	6.5 to 9.5 pH Units
Suspended Solids	25.0 mg/L
Ammonia Nitrogen	5.0 mg/L
Arsenic (total)	0.50 mg/L
Cadmium (total)	0.05 mg/L
Copper (total)	0.30 mg/L
Lead (total)	0.20 mg/L
Nickel (total)	0.50 mg/L
Silver	0.10 mg/L
Zinc (total)	0.50 mg/L

26. Any discharge to a Watercourse must meet a bioassay standard of a 96-hour at 100% LT₅₀ bioassay using rainbow trout, pH non-adjusted.
27. The points of compliance at the Bellekeno 625 adit and Bellekeno East decline for the effluent quality standards included in this licence shall be the final point of control prior to discharging effluent to the environment.

PART F – MONITORING AND SURVEILLANCE

28. The Licensee shall comply with the water quality monitoring program and surveillance network program contained in Schedule A of this licence.
29. 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.
30. Monitoring and sampling shall be carried out in accordance with the procedures and standards described in:
- Guidance Document for the Sampling and Analysis of Metal Mining Effluents, April 2001, (Report: EPS 2/MM/5), Minerals and Metals Division, Environment Canada;
 - Guidance Document for Flow Measurement of Metal Mining Effluents, April 2001,

Y H B

(Report: EPS 2/MM/4), Minerals and Metals Division, Environment Canada;

PART G – DESIGN AND CONSTRUCTION

Settling Ponds

36. The settling ponds at the Bellekeno East adit location shall be lined with an impermeable membrane, as described in the Application.
37. A minimum freeboard of 0.4 metres shall be maintained in all settling ponds.
38. No heavy equipment shall be operated within the Wetted Perimeter of any Watercourse.
39. Granular bedding and backfill material shall consist of non-frozen material.
40. 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.
41. Equipment shall be mechanically sound and free of leaks.

PART H - SITE DECOMMISSIONING AND RECLAMATION

43. The Licensee shall implement the decommissioning and reclamation plan as proposed in the Application for the advanced exploration program once the facilities are no longer in use. As part of each annual report, the Licensee shall report on the status of the decommissioning and reclamation plan activities.
 44. Subject to any required assessments, authorizations or approvals, the Licensee shall implement the plan required by this section of this licence.
-

Y W B

8

0207-677

SCHEDULE A**SCHEDULE A, PART I
MONITORING STATIONS**

Monitoring Station	Site Description	Easting	Northing
KV-37	Lightning Creek u/s Hope Gulch	490343	7087765
KV-38	Lightning Creek u/s Thunder Gulch	488188	7087345
KV-41	Lightning Creek u/s bridge at Keno City	485382	7086748
KV-42	Bellekeno 625 Adit	487428	7086944
KV-43	Bellekeno 625 Treatment Pond Decant	487419	7087052
KV-65	Thunder Gulch Upstream of Bellekeno – Relocated u/s Bellekeno East Portal		
KV-74	Bellekeno East – Adit		
KV-75	Bellekeno East - Treated		
KV-76	Thunder Gulch d/s Bellekeno 625 Adit		

**SCHEDULE A, PART II
MONITORING SCHEDULE FREQUENCY LEGEND**

Symbol	Frequency
BA	Every Second Year
D	Daily
A	Annually
Q	Quarterly May/July/October/February
M	Monthly

Y W B

8

QZ07-077

SCHEDULE A, PART III
MONITORING SCHEDULES

Monitoring Stations	Parameters						
	Total ICP Metals	Dissolved ICP Metals	Hardness	pH	Cond.	TSS	LT50
Treatment Sites							
KV-42	M	M	M	M	M	M	
KV-43	M	M	M	M	M	M	M
KV-74	M	M	M	M	M	M	
KV-75	M	M	M	M	M	M	M
Receiving Water Stations							
KV-37	Q	Q	Q	Q	Q	Q	
KV-38	Q	Q	Q	Q	Q	Q	
KV-41	Q	Q	Q	Q	Q	Q	
KV-65	Q	Q	Q	Q	Q	Q	
KV-76	Q	Q	Q	Q	Q	Q	

* ICP Metals include: Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc and Zirconium

Physical Inspection	Frequency
Treatment Site Settling Ponds	D

Y W B

8

QZB 7-177