



Alexco Keno Hill Mining Corp
1150-200 Granville Street
Vancouver BC V6C 1S4

June 10, 2010

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

Attention: Ms. Joelle Janes, Licencing Officer

Dear Ms. Janes:

Re: Bellekeno Mine Water Licence Application QZ09-092, Environment Canada Intervention

We would like to take this opportunity to provide clarification to the board by responding to the intervention to our project by Environment Canada (EC). For clarity, Environment Canada's Specific Recommendations are in italics while our response follows directly in regular font. Environment Canada's cover letter prior to their formal intervention recommendations highlights a concern with the ability of the current design of the Dry Stack Tailings Facility to meet the monitoring requirements in the Metal Mining Effluent Regulations (MMER). Alexco wants to inform the Board that we are currently in discussions with EC on how the DSTF design and operations will meet the monitoring requirements of MMER. Alexco will soon be self declaring that the Bellekeno project falls under MMER. In order to satisfy EC that the design of the DSTF meets the conditions of MMER, Alexco may add a supplemental engineered cemented tailings foundation at the base of the DSTF. The addition of cement in the first compacted layer of tailings in the DSTF will not change the overall design or geotechnical performance of the DSTF as currently contained in the licence application. In response to EC's

intervention, A letter from EBA Engineering is attached to this response which provides their opinion that the current DSTF design will not change as a result of the possible addition of cement in the DSTF foundation. Alexco continues to support the current DSTF design as a robust and environmentally protective design and any additions to the foundation would be made for the purpose of satisfying Environment Canada's concerns over the ability to meet the monitoring requirements of MMER.

Licence Term

Recommendation: *Licence term of 15 years.*

Alexco Response -- We would like to clarify that the term of the licence has been changed to 10 years to be consistent with the YESAB assessment of the project (YESAB file 2009-0030). This was discussed during adequacy review, see Exhibit 1.8 Question 91.

Reporting

Recommendation: *The Licensee should provide data electronically and include **all** data collected as part of this license. In addition to any other digital format used to present the data (e.g. pdf format), it would be helpful to all stakeholders, including regulatory agencies, if the data is reported in a format that would facilitate analysis and interpretation (e.g. electronic spreadsheet).*

Alexco Response -- Alexco will provide all data required by the licence to the board electronically and is amenable to providing data in Excel spreadsheet format if requested to do so.

Recommendation: *As constructed design details, including the coordinates and a figure showing the location of all constructed ponds including but not limited to: the **mill** site and DSTF collection pond, mill site treatment pond, polishing ponds, mine site (i.e. Bellekeno) water collection and treatment ponds, Galkeno 900 retention and treatment ponds should be provided prior to use of the ponds for mine operation. **All** points of discharge within the system or to a final point or points of control should be detailed on the as constructed design plan.*

Alexco Response -- Alexco agrees to provide as constructed design details for all constructed ponds and show all points of discharge within the system. The as constructed designs are not required prior to use of the ponds but will be provided.

We would like to point out to the Board that sizing for the mill site pond has been clarified during adequacy review (see Exhibit 1.10, Question 46) and additional rationale for the sizing and additional details regarding water management have been provided.

Water Balance and Water Management

Recommendation: *The Licensee should provide a water management plan, based on an updated water balance that presents at minimum, monthly predictions of flows (i.e. treated flows, adit flows, underground mining flows, fresh make-up water, wastewater, site runoff, dry stack facility runoff and seepage, waste rock runoff, precipitation volumes, snow accumulation, and other reasonable inputs/outputs) and available storage capacity in water management structures (i.e. ponds) for all phases of mine development from mill construction through operation and closure and for the range of anticipated operational scenarios such as extraction from Christal Lake vs. treated Galkeno 900 or Christal Creek for mill operation. The water management plan and associated revised water balance should be submitted to the Board within six months of signing of this licence and should be updated and submitted annually thereafter.*

Alexco Response -- Alexco concurs that a water management plan and updated water balance model should be developed as a condition of the licence and should be submitted within 6 months of the effective date and annually thereafter as part of the company's annual report.

Sludge Management

Recommendation: *The Licensee should provide a Sludge Management Plan specific to the Bellekeno mine development; including design details, construction diagrams and locations of any proposed sludge disposal areas other than the DSTF should be approved prior to deposition of sludge.*

Alexco Response -- Alexco agrees that a Sludge Management Plan specific to Bellekeno mine development should be developed as a condition of the licence and should be submitted within 6 months of the effective date.

Effluent Standards

Recommendation: *Based on a consideration of site-specific environmental factors and potential cumulative effects, discharge of effluent from the Bellekeno 625 treatment system should be managed so as to avoid loadings that would translate into a concentration in the receiving environment that is higher than the Total Zinc CCME guidelines for the protection of aquatic life at the confluence of Thunder Gulch and Lightning Creek.*

Alexco Response -- Additional water quality modeling at high and low flow regimes using a mass balance receiving environment water quality model approach was undertaken by Alexco and our consultant. This work supports Yukon Government's proposed lower discharge standards for a number of parameters. Details of the water quality model, including the aquatic resources assessment, can be found in the response to the intervention by Yukon Government. Discharge from the Bellekeno Mine will report below the confluence of Thunder Gulch and Lightning Creek.

Make-up Water Intake

Recommendation: *Within 6 months of signing of this licence, the licensee should provide to the Board a study detailing the potential impact to Christal Lake of withdrawing water at the allowable rate required for the milling operation. Mitigation measures should be identified in that plan. (Monitoring of water levels in Christal Lake is discussed in the following sections).*

Alexco Response -- In response to Environment Canada's recommendation that we should provide a detailed study of the potential impact to Christal Lake, we would like to point out to the Board that, as indicated by the Main Application Report, (see section 6.1.3.3) the prioritized water makeup sources are the mill site sedimentation pond and treated water from the Galkeno 900 adit. Christal Lake is considered as a contingency only. Furthermore, all proposed and contingency water sources and mill site discharge will report to Christal Lake. Thus, the net water balance for Christal Lake will be insignificantly affected.

We would also like to point out to the Board that basic hydrologic parameters for Christal Lake inflows and outflows and potential mill freshwater makeup sources were provided as part of the Application (see Exhibit 1.10 Table 6-3 Revision 1). Total water requested for the mill site including a 25% contingency (see Exhibit 1.11 number 4) is 81 m³/day. Should this water be drawn entirely from Christal Lake, this amounts to less than 2% of the average flow at KV-6 based on actual flow measurements (Table 6-3 Revision 1). Quarterly flows for KV-6 have been generated using the regional hydrology model and used for more detailed water quality effects modeling. These flows more accurately represent flows at KV-6 and can be used to calculate water usage as a percentage of quarterly flow. For Q1 (low flow), total proposed freshwater use if it were to come entirely and directly from Christal Lake would be 2.6% of the total flow at KV-6. During Q2 (high flow), freshwater use equates to 0.6% of flow at KV-6. The quarterly flow numbers used in these calculations can be found in Appendix B of our response to Yukon Government's intervention.

In light of the fact that Christal Lake is only proposed as a contingency water source, and the fact that total requested usage is such a small proportion of the outflow from Christal Lake, we feel that a more detailed study of the potential impact of the withdrawal of water from Christal Lake is unnecessary.

Monitoring Lake Levels

Recommendation: *The Licensee should monitor water levels in Christal Lake on a daily basis (i.e. using continuous monitoring equipment such as a level logger) and perform bi-weekly manual measurements of water level (i.e. at a surveyed a staff gauge) and ice thickness during frozen conditions. This data should be verified on a monthly basis and reported annually.*

Alexco Response -- As mentioned in the response to the previous recommendation on make-up water intake, Christal Lake is only considered as a contingency makeup water source, and may never be used as a makeup water source. Christal Lake water levels are not expected to be affected by milling operations. Given these expectations,

Environment Canada's recommendation for continuous daily monitoring and bi-weekly manual measurements of water level seem unnecessarily onerous. A more reasonable recommendation might be to undertake monthly water levels if water is ever withdrawn from Christal Lake.

Groundwater Monitoring

Recommendation: *The licensee should provide a detailed groundwater monitoring program plan for the monitoring of potential impacts on groundwater quality from mine project components including but not limited to the dry stack tailings facility, the mill site, the mine site, waste rock dumps and Keno landfill should be developed and submitted to the Board within six months of signing of the licence. The primary objective of the plan should be the early detection of groundwater impacts and potential for resulting impact to the receiving environment. The Licensee should implement the plan prior to starting the placement of tailings in the DSTF or waste rock into the waste rock dumps. This plan should include determining the existing and/or potential groundwater impacts from the existing Keno City dump which might be located upgradient of the mill site. The findings of the groundwater monitoring plan should be used to modify the terms of the license to include and specify groundwater monitoring points, monitoring schedule and parameters. The plan should be developed by a qualified professional. The Board may consider requesting that the Licensee apply for an amendment to include groundwater monitoring locations in the license.*

Alexco Response -- Alexco expects to further develop, submit and conform to a groundwater monitoring plan for all components of the Bellekeno project. Groundwater monitoring wells are already in place for the mill site and Keno Landfill (see Exhibit 1.12) including recommendations for monitoring schedules, parameters, and additional shallow groundwater monitoring for the DSTF. Although there are already groundwater monitoring wells in place that cover the Keno City Landfill, Alexco does not believe that overall monitoring of the Keno City Landfill should be an obligation or requirement of the water licence for the Bellekeno Mine Project.

Alexco concurs with a requirement for the submission of a groundwater monitoring plan as a condition of the water licence but we are not in agreement with having a condition for the company to amend its licence built in to the licence, as provision for amendment is found in the Waters Act.

Meteorological Monitoring

Recommendation: *- Meteorological monitoring data should be reported monthly and a summary of all data for the period or record of the monitoring station should be presented in the annual report.*

Alexco Response -- Meteorological information is currently collected continuously from a station located on Galena Hill. Due to its remote location it is physically downloaded several times annually. We feel that annual reporting of this metrological data is sufficient. In our response to Yukon Government's intervention, we have further agreed to their recommendation that a site metrological data be used to update hydrological parameters.

Seepage Monitoring

Recommendation: *The Licensee should conduct a seepage inspection and monitoring program monthly (April to October) and at least once during winter months to include newly constructed: roadways, pads and lay down areas, waste rock storage, mill area and dry stack tailings facility. The relevant monitoring parameters should include at a minimum: visual observations and photographs, geographical coordinates, flow; field temperature; field Conductivity / Specific Conductance; field pH; Total and Dissolved ICP Metals; Alkalinity; Acidity.*

Alexco Response -- Alexco agrees that a physical inspection monthly from April to October and at least once during winter months for all roadways, pads and lay down areas including the Non-AML waste rock disposal area, temporary potentially-AML waste rock storage facility, mill area and dry stack tailings facility is a reasonable undertaking and should be included as a term of the licence.

Laboratory Requirements

Recommendation: *With respect to the Surveillance Program, we recommend that the Board require that all samples collected in relation to a regulatory requirement ("external analysis") be analyzed at a CAEAL-accredited external laboratory.*

Alexco Response -- Alexco agrees that with respect to the Surveillance Program, all samples collected in relation to regulatory requirements be analyzed at a CAEAL-accredited external laboratory.

Reports

Recommendation: *A site specific adaptive management plan (AMP) for the Bellekeno Mine project should be developed to deal with potential project specific issues, clearly defining specific and reasonable triggers for this project. The AMP should include the following components:*

- *the results of environmental audits or other evaluation activities;*
- *the results of environmental monitoring*
- *the results of monitoring of the performance or condition of environmental*
- *infrastructure, such as containment structures, water management systems or*
- *treatment facilities;*
- *technological developments; and*
- *changing environmental conditions.*

Alexco Response -- Alexco agrees that a site specific AMP should be developed to deal with potential project specific issues and define specific and reasonable triggers and management measures. The AMP should include all of the components listed in Environment Canada's intervention (above).

ARD/ML

Recommendation:

The Board should consider a licence clause which reads:

If mine waste rock is utilized for construction of roadways, pads, lay down areas, and related features; then only non-ARD/ML generating ("non AML") waste rock shall be used for that purpose.

Any waste rock to be used for construction proposed shall be geochemically stable such that ARD/ML is not a concern for the use of this material for general construction.

Alexco Response -- Alexco agrees with Environment Canada's recommendation with respect to the use of P-AML rock and would like to clarify that this recommendation that only Non-ARD/ML be used for construction purposes is what we have proposed in the Application (e.g. Table 6-9 of the Main Application Report).

Should you have any questions, please contact our office at (604)-663-4888.

Sincerely,
Alexco Keno Hill Mining Corp



Robert L. McIntyre, R.E.T.
Vice President, Business Development
Alexco Keno Hill Mining Corp

cc. external D. Buyck, FNNND, R. Holmes, YG EM&R, R. Lamb, YG Environment, C. Scheu, Yukon Water Board, S. Arell, Environment Canada
cc. internal C. Nauman, B. Thrall, T. Hall, D. Whittle, Alexco Resource Corp.
E. Allen, T. Lunday, Access Consulting Group

Attachments: letter from EBA June 11, 2010

June 11, 2010

EBA File: W14101178.009

Alexco Resource Corp.
3-151 Industrial Road
Whitehorse, Yukon Y1A 2V3

Attention: Mr. Rob McIntyre, Vice President

Subject: Inquiry on use of an Engineered Cemented Tailings Foundation for Dry-Stacked Tailings Facility - Bellekeno Mine Mill Site, Yukon

Alexco Resource Corp. (Alexco) has requested that EBA review and provide geotechnical comments on Alexco's proposal for the use of an Engineered Cemented Tailings Foundation (ECTF) as a low-permeable base for the Dry-Stacked Tailings Facility (DSTF). EBA met with Alexco on June 10, 2010 to discuss the design. The design concept is to mix the filtered tailings with cement to create a soil-cement, which can be used as the base layer for the DSTF. The intention of the soil-cement base is to act as a low-permeability layer separating the tailings from the gravel under-drain. A second drain is proposed above the soil-cement base as a part of the ECTF.

The preliminary details of the ECTF are to mix the first 0.5 m of filtered tailings with a cementitious material and possibly other additives to create a cemented paste. Design of cemented paste tailings was conducted by Paterson & Cooke (2009).

Data from Paterson & Cooke (2009) show that using the tailings at 21% moisture content combined with 6% cement will create cemented paste tailings with a 7-day unconfined compressive strength of 0.7 MPa and a 14-day unconfined compressive strength of 1.0 MPa. This would yield a density of 2130 kg/m³, a cement content of 128 kg and a water to cement ratio of 3.5. If the cement content is increased to 12%, then the paste tailings will have a 7-day unconfined compressive strength of 2.9 MPa and a 14-day unconfined compressive strength of 4.8 MPa. This yields a density 2210 kg/m³, a cement content of 265 kg/m³ and a water to cement ratio of 1.75.

Typical cement contents for soil-cement are 80 to 255 kg/m³ (Kosmatka, 2002). The minimum compressive strength of the soil-cement for this type of application would be approximately three-times the strength of the soils beneath it. It is anticipated that the gravel and glacial till soils beneath the proposed ECTF have a compressive strength of approximately 0.3 MPa. Therefore, the minimum soil-cement compressive strength should be 0.9 MPa for use over these soils.

Both the 6% and 12% mixes summarized in Paterson & Cooke (2009) meet the above guidelines for cement content and compressive strength.

It may be beneficial to add bentonite to the soil-cement to decrease its permeability and help prevent cracking. If bentonite is added it should be used at ratio between 30% and 100% of the cement

added. If bentonite is added the anticipated permeability of the ECTF would be between 1×10^{-8} and 1×10^{-10} m/s (Mikkelsen, 2002).

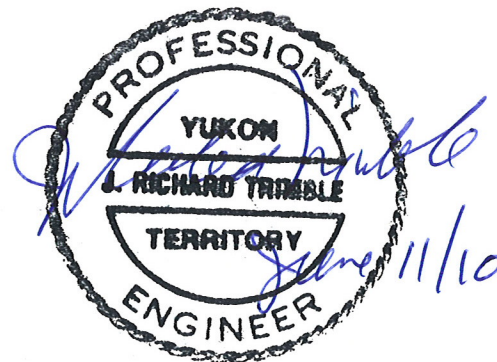
Based upon the above review, EBA considers the cemented paste tailings acceptable for use as an ECTF for the DSTF. Addition of this layer with an additional drain layer, such as geo-net drain, will not change any data or recommendations presented in our report "Preliminary Engineering Design and Management Plan Dry-Stacked Tailings Facility Bellekeno Mine Mill Site, Yukon". Detailed design of the ECTF should be completed in conjunction with the detailed design of the DSTF, prior to construction.

We trust that this letter meets your current needs. If you require any further information or have questions please contact Chris Dixon.

Sincerely,
EBA Engineering Consultants Ltd.



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REFERENCES

EBA Engineering Consultants Ltd. (2010), "Preliminary Engineering Design and Management Plan Dry-Stacked Tailings Facility Bellekeno Mine Mill Site, Yukon" Report Submitted to Alexco Resources. EBA File: W14101178.003

Kosmatka, Steven H., et. al (2002), "Design and Control of Concrete Mixtures", Portland Cement Association.

Mikkelsen, P. Erik (2002). "Cement-Bentonite Grout Backfill for Borehole Instruments", Geotechnical Instrumentation News December 2002.

Paterson & Cooke (2009), "Alexco Bellekeno Paste Project Cemented Paste Test Results". Report Submitted to Alexco Resources. Report Number: WDA-5063 R02 Rev B.