



Environment

Box 2703, Whitehorse, Yukon Y1A 2C6

YUKON WATER BOARD

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APPL. NO. QZ06-074

August 27, 2007

Application Number: QZ06-074

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

Attn: Kelly Boutilier, Licencing Officer

Re: Intervention for Type B Water Licence Application QZ06-074, Elsa Reclamation and Development Company

The Yukon Department of Environment (DOE) has completed its review of this Type B water licence application. We are not intending to appear at a public hearing to make representations in connection with this matter, but would participate if a hearing is convened by the Water Board.

Background – Assessment Phase

The assessment phase of this waster use application was conducted by the Mayo Designated Office under the Yukon Environmental and Socio-economic Assessment Act (YESAA) – reference project #2006-0293. After concluding the assessment of the project, an Evaluation Report with recommended terms and conditions was prepared by the Designated Office and issued on February 15, 2007.

The Decision Body under YESAA for the application is Yukon Government, Assessment and Abandoned Mines Branch of the Department of Energy, Mines & Resources. Yukon Government varied the recommendation from the Evaluation Report and issued a Decision Document on March 9, 2007 (Exhibit 9.2)

The following recommendations with rationale for this water licence application are presented to the Water Board and are cross referenced with the recommendations found in the YESAA Decision Document where appropriate.

1. Water Treatment Systems

YESAA Decision Document: Recommendation #5

“Construct and or maintain water treatment and retention infrastructure in order to not release non compliant water into the environment.”

The construction and operation of water treatment facilities that are able to consistently meet discharge standards from the 5 existing treatment sites is of paramount importance in this licence application. The present ongoing difficulties in achieving water quality objectives from existing treatment locations are documented in the Water Treatment Improvements Study

(Exhibit 1.4.1). These existing treatment systems are inadequate to reliably meet discharge standards outlined in the previous Water Licence for the Keno Hill Mine Site, QZ96-001.

Properly functioning treatment systems can give certainty to regulators and the historic objectives for the mine site, described in QZ96-001 can be met. Improvements to the existing 5 treatment sites will require engineered treatment systems with predictable performance.

Recommendation:

- Construct and or maintain water treatment and retention infrastructure in order to not release non compliant water into the environment

2. Effluent Quality Standards

YESAA Decision Document Recommendation #3

“Discharge standards for treated effluent should be such that they do not allow an increase in the contaminant loading to the receiving environment from the levels allowed under the previous water licence QZ96-001.”

During the assessment phase (YESAB review) of this Water Use application, Yukon Environment recommended that the new operator, ERDC, retain the discharge standards from the expired licence QZ96-001 for the mine site. This requirement is stated in the Decision Document recommendation.

According to the most recent correspondence from ERDC on WQ standards (Exhibit 1.3, letter March 23, 2007)), the proposed maximum grab concentrations are double that of the expired Licence.QZ96-001. Yukon Environment does not support the discharge standards proposed by ERDC as there is no scientific rationale provided. In addition, the standards proposed by ERDC do not encourage improved efficiencies and upgrades to the existing effluent treatment systems.

Recommendation:

- Retain discharge standards from expired licence QZ06-001 for the mine site
- Effluent discharged from the 5 treatment sites during the term of this Licence must meet the following effluent quality standards:

Parameter	Maximum Grab Concentration Standard
pH	6.5 to 9.5 units
Suspended Solids	25 mg/l
Toxicity (LT ₅₀ 96hr @ 100%)	100% (pH non-adjusted)
Arsenic total)	0.5 mg/l
Cadmium (total)	0.05 mg/l
Copper (total)	0.3 mg/l
Lead (total)	0.2 mg/l
Nickel (total)	0.5 mg/l
Silver (total)	0.10 mg/l
Zinc (total)	0.5 mg/l

3. Settling Ponds

YESAA Decision Document Recommendation #6

"Ensure that all settling ponds are lined to prevent release of non-compliant water through ground"

Settling ponds associated with the Bellkeno and Silver King water treatment sites are presently unlined. These unlined settling ponds have known seepage of non-compliant mine effluent which enters groundwater and potentially down-gradient surface water. Installing liners in all settling ponds will prevent release on non-compliant water into groundwater.

Sufficient freeboard should be maintained in settling ponds to ensure overtopping of non-compliant effluent does not occur during spring freshet, precipitation events or unforeseen adit flow increase. The recommended freeboard in QZ96-001 was 0.4 m

Recommendations:

- Install impermeable engineered liners in all settling ponds associated with the 4 adit treatment sites in order to eliminate seepage to groundwater.
- Maintain sufficient freeboard (0.4 m recommended) in settling ponds so that overtopping does not occur.

4. Sludge Management

As outlined in the Water Treatment Improvements Study (Exhibit 1.4.1), sludge management is a significant issue from both a treatment facility efficiency perspective and for permanent disposal in a benign fashion. This is particularly the case for Galkeno 300.

Recommendation:

- Develop and submit 90 days prior to implementation, a sludge management and disposal plan. The Plan should identify a permanent disposal location that will not result in remobilization of the sludge over the long term.

5. Valley Tailings Area

Correspondence from EBA Engineering Consultants Ltd. in this application (Exhibit 1.3.1) indicates that the annual geotechnical engineering inspection of the valley tailings facility was not possible in 2006 "due to the early onset of winter". Annual inspection and monitoring of the valley tailings area is required.

Recommendation:

- An inspection and monitoring plan for the valley tailings area should be submitted and implemented.
- Annual inspection and monitoring of the valley tailings facility to ensure the dams do not pose a hazard to the downstream environment.

6. Water Monitoring and Compliance Locations

YESAA Decision Document Recommendation #2

"Water samples from all treatment facilities should be collected from end of pipe or last point of control."

Water monitoring locations and frequency of sampling at existing sites as outlined in this water use application are acceptable. The exception to this is the proposed new effluent discharge and release point from the Galkeno 300 treatment system. The end of pipe or last point of

control for effluent discharge from Galkeno 300 is proposed as via pipe to a ditch at Calumet Drive (Drawing 1, ERDC Water Treatment Capital Improvements – Phase II, Exhibit 1.4.2). The location where the pipe ends and effluent enters the ditch is recommended as the compliance and monitoring location.

Recommendation:

- Adopt existing water monitoring schedule into the Licence.
- Monitoring and compliance point for Galkeno 300 discharge to be at end of the proposed pipe where effluent enters the ditch at Calumet Drive.

7. Groundwater

An important aspect at the Keno Hill mine site that has not been fully addressed in this Water Use Application is groundwater quality. The amount of contaminant loading from the various untreated adit locations, treatment locations with unlined ponds, waste rock dumps and the tailings pond is not known. A groundwater monitoring program was included in the previous expired licence QZ96-001.

Recommendation:

- A groundwater monitoring program should be developed and implemented during the term of this licence to understand contaminant loadings from the entire mine site and guide future closure planning for the site.

8. Adaptive Management Plan

YESAA Decision Document Recommendation #7

“Proponent must develop an Adaptive Management Plan with appropriate regulators that considers the following:

Adaptive Management Plan (AMP)

Adaptive management plans can be an effective way of identifying and responding to potentially adverse effects that may arise due to unpredictable changes in the project environment. The proposed project involves the monitoring and treatment of metal laden water discharges coming out of old adits in a number of locations on the UKHM property. A complete understanding of the area hydrology is not understood at this time and requires the implementation of programs to characterize hydrology and hydrogeology. In order to effectively mitigate potential effects of drastic changes in the hydrogeological regime (e.g. Galkeno 300) an adaptive management plan including the following information must be developed, for approval by the appropriate regulator.

Plan Objective – Develop a process that measures and identifies any changing, or new, water discharges and increases in contaminant concentrations on site, and triggers appropriate actions based on the potential environmental and socioeconomic effects of those changes.

Plan Goals – Establish and apply appropriate site specific water quality standards, with consideration of zinc, cadmium, lead, arsenic and other contaminants, that protect aquatic life and the environment. Where possible, efforts must be made to minimize contaminant loading to the receiving environment. The plan should explicitly manage low level and incremental changes to flow and contaminant levels (Adaptive Management Plan) and drastic changes to flow and contaminant levels (Emergency Response Plan).

Adaptive Management

- Description of flows and contaminant concentrations from mine workings and historic conditions (baseline conditions)

- Routinely monitor existing treatment sites and mine workings to detect any increases in flow or contaminant concentrations.
- Routinely monitor untreated adits and discharges to detect any increases in flow or contaminant concentrations.
- Develop appropriate triggers/thresholds for response.
 - a. Increases in a contaminant level approaching thresholds at a site should result in more frequent monitoring at that site.
 - b. If increases in flow and or concentration are approaching thresholds at a site, an action plan must be developed.
 - c. If flow and/or concentrations exceed a threshold at a site immediate notification to the appropriate regulator, and implementation of the action plan are required.
 - d. Action plans must be approved by the appropriate regulator.
 - e. Periodically review the AMP with the appropriate regulator.
 - i. Regular reporting on all plans and studies is imperative.

Emergency Response

Development of a plan that will respond to drastic or unforeseen discharges or infrastructure failure to control large volumes of water and/or high contaminant concentrations from entering the environment. The plan should include but is not limited to the following:

- Details on management of spring freshet volumes.
- Describe immediate actions to control water flow until the contaminant levels can be measured and the risks or effects can be determined at which point appropriate actions are triggered.
- Where effluent volumes and contaminant levels are known, appropriate plans for dealing with infrastructure failure should be presented by the proponent and approved by the appropriate regulator.”

There are numerous adits on the Keno Hill mine property that currently discharge metal-laden effluent into the environment without treatment. Yukon Environment considers this effluent to be a waste as defined in the Waters Act. The uncontrolled and untreated release of this waste can have a negative effect on groundwater, water quality and aquatic life. In addition, drainage from untreated adit sites has the potential to contribute to overall metal loading into the aquatic environment from the Keno Hill mine site.

An Adaptive Management Plan was prepared by ERDC in July 2007 (Exhibit 1.4.3). We question the standard deviation approach to specific thresholds that will initiate the action plan as described in the AMP (ie Section 4.4, 8.4). For example, we do not support the use of the threshold:

“three consecutive monitoring results at a sampling site where total zinc concentration is greater than three times (3X) the historical standard deviation for that site”.

This standard deviation approach is not the most useful method in determining thresholds for action at untreated adit sites. The use of standard deviation requires a sufficiently large data set to be meaningful. For many of these adit sites there is not enough data to calculate a history of metal parameters or flow accurately, and other locations have not been previously measured at all.

We recommend the following be adopted instead:

“any change in discharge that would double the metal load and would exceed the discharge standards at the regulated treatment sites”.

This threshold would consider both the increase in flow volume from an adit and/or metal concentration increase. We support the balance of the AMP and request annual reporting of activities under the AMP.

Recommendation

- Design and implement an Adaptive Management Plan that addresses existing presently untreated effluent release sites and responds to unforeseen or contingency events related to effluent release and water quality and other mine components at the Keno Hill property.
- Change threshold in sections 4.4 and 8.4 of the AMP to “any change in discharge that would double the metal load and would exceed the discharge standards at the regulated treatment sites”.
- Annual reporting of activities conducted under AMP submitted to the Board

9. Environmental Monitoring

YESAA Decision Document Recommendation #4

“The proponent shall develop and maintain a receiving environment monitoring program for both fish survey and benthic invertebrate sampling at all receiving water sites to determine any changes or long-term trends in the aquatic health of the receiving waters downstream of the Keno Hill mine site properties. Results shall be submitted to the appropriate regulator at a minimum, annually.”

Environmental Monitoring at the Keno Hill Mine site is currently ongoing and is acceptable to regulators.

Recommendation

- Adopt and implement Environmental Monitoring Program as proposed in application with annual review.

10. Silver Trail Glaciation from Galkeno 300 adit

YESAA Decision Document Recommendation #10

“The proponent must manage the glaciation on the Silver Trail Highway, in cooperation with the Government of Yukon, where it flows from the Galkeno 300 in order to ensure icing does not affect the safe use and efficient maintenance of the Highway. Management shall include compensation to YG Highways for additional costs incurred beyond normal maintenance costs and identify long term solutions to permanently correct the hazard.”

Effluent discharge from the Galkeno 300 adit currently drains downslope to the Silver Trail, a Yukon public highway. The discharge has caused glaciation problems on the highway and presents both maintenance and public safety issues.

Since the time of the YESAA Decision Document, the ERDC Water Treatment Capital Improvements Study – Phase 2 has recommended the relocation of the Galkeno 300 discharge away from the Silver Trail. The treated effluent is proposed to flow via pipe to a ditch at Calumet Drive, and from there to Hinton Creek and Cristal Lake (Drawing 1, Exhibit 1.4.2). We support this relocation of Galkeno 300 adit effluent as it will divert all piped water away from the Silver Trail and should solve the majority of the glaciation problem.

Groundwater seepage from Galkeno 300 and associated underground workings, however, will still have the potential to “daylight” at the Silver Trail. For this reason we recommend continued monitoring of seeps and potential glaciation at this location.

Recommendation

- Re-route Galkeno 300 discharge away from Silver Trail as proposed in the ERDC Water Treatment Capital Improvements Study – Phase 2.
- Monitoring of groundwater seeps above Silver Trail from Galkeno 300 adit to document change in glaciation pattern with re-routed discharge.

11. Licence Term

YESAA Decision Document Recommendation #8

“Care and maintenance water licence term revised to five years.”

The Keno Hill mine site is presently without a Water Licence. The previous water licence QZ96-001, was for a five year term and expired on December 31, 2003. ERDC is the new operator at the mine site and requires a licence. The duration of past Licence terms for the Keno Hill Mine Site have been, for the most part, for 5 years.

Recommendation

- 5 year licence term for consistency with past licences for the site.

12. Decommissioning

Yukon Environment recommends that ERDC submit a Final Closure and Reclamation Plan within 2 years of the effective date of this Licence. ERDC has indicated that they are in the process of developing a site wide closure plan for the entire Keno Hill area. A two year timeframe will provide for a sufficient length of time to complete this Plan.

Recommendation

- Provide to the Board a Final Closure and Reclamation Plan within 2 years of the effective date of the Licence.

13. Plan Submission

Plans submitted by the proponent under this Licence should undergo a review by interested parties, including Yukon Government. This will allow for input and revision of the plans by those parties to ensure that the plans are appropriate and consistent with Licence conditions.

Recommendation

- Provide opportunity for input and review of plans required by interested parties prior to submission of those plans to the Water Board.

14. Licence Enforcement

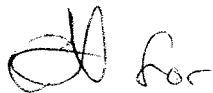
Water Resources Section of the Environmental Programs Branch has prepared a document intended to assist the Board in the drafting of Water Licences from a regulatory enforcement perspective. The document entitled *Enforcement Concerns Related to Standard and Typical Clauses in Water Use Licenses* is attached to this intervention for the Boards consideration.

Recommendation

- That the Board consider the recommended actions identified in *Enforcement Concerns Related to Standard and Typical Clauses in Water Use Licenses*

Thank you for the opportunity to review and respond to this application. As required by the Board, a copy of this intervention has been forwarded to the applicant and a copy in electronic format forwarded to the Board. Any further correspondence may be forwarded to the undersigned.

Sincerely,



Randy Lamb
Manager, Environmental Affairs

Attachment

copy: Elsa Reclamation and Development Company Ltd.
Environment Canada