
**Supplementary Information for
Type A Water Licence Application
Ketza River Mine**

Project No. 1240137

October 2004

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

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Type A Water Licence Application
Ketza River Mine**

Submitted To:

Ketza River Holdings Ltd.
Vancouver BC

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FIGURE

1.0 INTRODUCTION

1.1 Background

The previous water licence for the Ketz River Mine (Y-IN87-06L) was originally granted to Canamax Resources Inc. on May 1, 1987. In August 1989 the licence was amended to include the requirement for an abandonment plan. In 1990 Canamax applied for an amendment to the existing water licence to allow the mining of sulphide ore. In November 1990 the mine operation was suspended and the application for amendment of the water licence was later withdrawn. Eventually the mine was sold to Wheaton River Minerals Ltd. in November 1992 and in 1994 the mine was transferred to Ketz River Holdings Ltd., a wholly owned subsidiary of YGC Resources Ltd.

Water quality at the site was monitored by Ketz River Holdings Ltd. until 1996. During that time various attempts were made to complete an abandonment plan for the mine. To date there are still outstanding issues regarding stability of the tailings impoundment, water quality, in particular dissolved arsenic concentrations, and long term monitoring and maintenance of the site.

In September 2004, Water Resources instructed Ketz River Holdings Ltd. to obtain a water licence for the mine.

1.2 Overview

The objective of obtaining a water licence for the Ketz River Mine is to enable ongoing monitoring and maintenance at the mine and in particular the tailings pond and surface water drainage courses.

It is recognized that there are outstanding issues with the current state of structures and the interpretation of how the mobilization of metals and specifically arsenic will impact groundwater and surface water down gradient of the tailings pond. These issues will require additional information in order to be properly addressed. Short term solutions are proposed in this application that will help address concerns expressed by Water Resources and Environment Canada in the interim while additional information is being collected. A proposed timeframe for the short term solutions and evaluation of additional information has been provided in this document (see responses to questions 16 & 19).

In particular the development of decommissioning plans is dependant on the future plans for the mine. Therefore, decommissioning plans should be developed following the completion of additional exploration work, which will determine whether the mine will go back into operation.

2.0 SUPPLEMENTARY INFORMATION

The information provided in the following sections corresponds to the questions as they appear in the application form.

2.1 Section A: General Information

Question 12

Meetings have been held with the Chief and members of the Ross River Dena Council during visits to the mine by Ketza River Holdings Ltd. personnel in September and October 2004. Arrangements have also been made to employee members of the First Nation for the following activities:

- repairing the bridge decks along the access road to the mine,
- installing and clean out of existing culverts,
- repairing road washouts, and
- installation of new generator and repair of damage to electrical circuits.

Question 15

While the undertakings which are the subject of this application do not require other permits, exploration work in the area is being considered. The exploration work would be permitted independently of this application.

2.2 Section B: Project Description

Question 16

The ongoing care and maintenance of the mine and particularly the tailings pond will generally include the following.

- Upgrading of the existing access road to provide proper access for men and equipment into the site.

- Maintenance of existing surface diversions for Subsidiary Creek (northern side of tailings pond) and Cache Creek to divert surface water around the tailings pond.
- Monitoring of water quality within the tailings pond, the seepage ponds and in Cache Creek. Monitoring will also include seepage rates below the dams and groundwater levels and water quality in functioning piezometers (see response to question 58).
- If water quality in the tailings pond passes water quality standards imposed for discharge (including LC₅₀ toxicity tests) then tailings water would be discharged to lower the level of liquid in the tailings pond.
- The installation and operation of a water treatment plant to replace equipment that was removed from the site. This will require replacement of the camp's electrical generator (generator has been purchased) and pumps to be operated at seepage collection ponds KR4 and KR5 downstream of the North Dam and the South Dam respectively.
- Water treatment is expected to start in the summer of 2005. Seepage water will be pumped from below the tailings dams to the water treatment facility where treatment with ferric sulphate and lime will occur. Ferric sulphate would be applied at a mix ratio of > 5:1 to arsenic. Arsenic precipitate will be stored and liquid would be returned to the tailings pond.
- Once additional exploration work has been completed and results assessed, a decision would be made respecting the future of the mine. Once that information is available a long term monitoring program can be developed and an appropriate decommissioning plan established.

Question 19

Exploration work is expected to occur from the winter of 2004 through to the summer of 2006. Once the results of the exploration work have been evaluated (2006) the mine may go back into production some time after 2008.

Question 23

Underground workings remain from work conducted under a previous water licence. Drainage from Portal 1430 is directed through a four inch pipe to the tailings pond. The quantity of water varies seasonally and the last known sampling event was 1996.

Question 26

Site characterization information has been collected and presented in numerous reports relating to assessments prior to establishing the mine site and construction of facilities including the tailings pond. As regulators have questioned some of this information, it is Ketz River Holdings Ltd.'s intention to contract a qualified engineering firm to evaluate the available information and collect additional information. All findings would then be used in developing a short-term water quality management program and addressing longer term issues such as structural integrity of the tailings pond dams, seepage, water quality and ultimately the finalization of decommissioning plans.

2.3 Section D: Uses

Question 33

There are no new watercourse crossings planned, however, repair and ongoing maintenance of existing structures is anticipated to render the access road usable. This will include repair or replacement of most bridge decks and backfilling around culverts to level crossings. Clearing of culverts in diversion ditches, particularly along the northern side of the tailings pond, is also required. A list of expected work is provided in Table 1.

Table 1: List of work

Kilometre	Type of Work	Explanation
3.7	Install Culvert	Blocked culvert resulted in a washout of 5ft of the road.
3.7	Clear Culvert	See above
1 st bridge	Replace Bridge Decking	Replace present 8" x 3" decking with 8" x 4" decking.
2 nd bridge	Replace Bridge Decking	Replace present 8" x 3" decking with 8" x 4" decking.
3 rd bridge	Replace Bridge Decking	Replace present 8" x 3" decking with 8" x 4" decking.
35.6	Replace Culvert	Culvert has been washed away leaving a 12 ft gap in the road. The plan is to replace the original culvert with one of a similar size and to install another culvert slightly higher and to one side of the original culvert. Both culverts would be in the 12 ft washed away section.

Question 34

At this time no new watercourse training is planned, however, it is recognised that seepage from the North and South dams is carrying contaminants toward Cache Creek. To reduce seepage into the tailings pond, and out of the tailings pond into the seepage ponds, additional alterations to the diversion ditches may be required. Details cannot be developed until additional monitoring information is available. It is anticipated that details of any alteration of the current surface water control structures would be provided in a licence amendment application.

Question 35

Ongoing maintenance of existing diversion structures is anticipated as well as potentially upgrading erosion protection and reducing seepage from diversion ditches into the tailings pond and seepage ponds.

Question 36

There are existing waste rock dumps at the mine site, however, no additional waste rock will be added to these locations. Some stabilization of slopes may be undertaken.

Question 37

The North and South Tailings Pond Dams will be assessed as part of the planning process for ensuring long term stability and reducing seepage. It was recognized as early as 1989 (Golder Associates, 1989) that steps should be taken to reduce seepage into the tailings pond, out of the tailings pond, and to lower the water level in the pond to improve dam stability and reduce risk. It has also been recognized in correspondence from regulators that additional information is needed to ensure adequate planning of corrective measures.

Ketza River Holdings Ltd. plans to contract a qualified engineering firm to undertake the appropriate assessments and to design structures to stabilize the existing dam structures.

2.4 Section E: Hazardous Materials and Spill Contingency

Question 39

Most hazardous materials have been removed from the site. One container of cyanide brick remains at the site. Arrangements have been made for the transport and use of this material at a mill in Northern B.C.

Diesel fuel will be required on site for the operation of the electrical generator. An above ground fuel storage tank, that is currently on site and is equipped with spill containment, will be used for fuel storage. A commercially available hydrocarbon spill response kit will be located in an accessible area in close proximity to the generator. Typical contents include personal protective gear, absorbent booms and pads as well as a liner material for temporary storage of contaminated materials. Hand tools will also be available for constructing temporary dikes and collection of contaminated materials. A spill response plan outlining response procedures and emergency contact numbers will be posted with the spill kit.

2.5 Section F: Emergency Response

Question 40

Since this application addresses ongoing care and maintenance there will not be ongoing work associated with material stockpiles and mining equipment on site. However, the stability of the tailings dams is an issue of concern expressed by YTG Water Resources and Environment Canada. Part of the proposed work will include assessment of these structures, in particular the tailings pond and dams for the purpose of developing plans to ensure the long term stability of the structures, assessing potential failures and developing corresponding responses.

2.6 Section G: Water Balance Model

Question 41

A revised water balance model will be developed following determination of the future of the mining operation.

2.7 Section H: Water Quality Model

Question 42

The most recent information relating to water quality has been obtained from Environment Canada and the Government of Yukon Environment Department. This information will be supplemented with additional monitoring information to develop a long-term program for meeting water quality objectives. It is recognized that insufficient information exists to adequately model the rates of seepage and potential for metals mobilization. Development of a comprehensive water quality model will, therefore, have to wait on additional monitoring data.

2.8 Section I: Project Effects

Question 43

During previous reviews of licence and amendment applications, concerns have been expressed that fish in Cache Creek could be affected. The primary concern relates to the potential for dissolved arsenic to be mobilized in seepage from the tailing pond and eventually enter the Cache Creek.

A 1991 study of Cache Creek indicates that grayling, whitefish and slimy sculpin were found in small numbers in most reaches of Cache Creek. Monitoring results from KR-8 (YTG Water Resources, July 21, 2004) indicate that arsenic is reaching Cache Creek, although concentrations are below 0.05 mg/L at KR-8. Monitoring data did not include background arsenic concentrations, however, it is Ketz River Holdings Ltd's intent to pump and treat seepage water as an interim step, while data is collected to develop comprehensive plans.

Given the available information and the intention to treat seepage water it is anticipated that potential impacts to fish and fish habitat will be mitigated.

Question 46

Limited information is available on wildlife use of the area. Information contained in the 1994 screening report by the Department of Indian Affairs and Northern Development indicates that the general consensus is that the mine had minimal impact on wildlife during operation and therefore, similar minimal impacts should be expected during any ongoing maintenance activities.

Question 49

See response to Question 42.

2.9 Section J: Decommissioning Plans

Question 56

Numerous attempts have been made to develop decommissioning plans for the mine. The most recent plans were drafted by Steffen Robertson and Kirsten in 1994 with an addendum in 1996. Additional information is needed to address concerns regarding dam stability and water quality. It is proposed that this additional information will be collected in 2005. It is also expected that additional exploration work will be completed and a decision respecting operation of the mine would be made by 2006. Details of any decommissioning plans need to consider the future activities at the mine and therefore would be developed following the determination of whether or not the mine will be reactivated.

Question 57

Monitoring plans for the temporary or permanent abandonment of the site will be dependant on the details of the decommissioning plans discussed in response to Question 56. These plans will be developed as part of the decommissioning plans. As part of this licence application the current plans for monitoring until the future of the mine has been finalized are provided in response to question 58.

2.10 Section K: Monitoring Plans

Question 58

The monitoring program proposed for the site would consist of surface water quality and groundwater quality monitoring. The proposed monitoring locations and sampling logic are provided in Table 2. Groundwater monitoring wells were selected based on location and historical data indicating that the wells were intact and typically had sufficient water for sampling purposes.

Sample analysis would be consistent with the monitoring programs previously employed at the site. In general surface water samples would be collected monthly (May to October)

and analysed for routine physical and chemical parameters (pH, electrical conductivity, nitrate - N, nitrite - N, Sulphate (SO₄), hydroxide, carbonate, bicarbonate, total alkalinity (CaCO₃), total suspended solids, total dissolved solids, ammonia - N, and cyanide - WAD) as well as total metals and dissolved arsenic.

Groundwater wells would be monitored monthly (May to October) for static water level and water samples would be collected and analysed for routine physical and chemical parameters (pH, electrical conductivity, nitrate - N, nitrite - N, Sulphate (SO₄), hydroxide, carbonate, bicarbonate, total alkalinity (CaCO₃), total suspended solids, total dissolved solids, ammonia - N, and cyanide - WAD) as well as total metals and dissolved arsenic.

Environment Canada (1999) suggests that the current network of functional wells (seven) may not adequately represent the major groundwater flow paths. The report also suggests monitoring the wells twice a year. A more intensive monitoring program has been proposed here to assist in understanding seepage through the dams. It is also anticipated that as further assessment of the tailings dams is undertaken additional wells will be placed along the dams and possibly immediately down gradient. Additional wells would be added to the monitoring network as they are installed.

Table 2: Water Quality Monitoring Locations and Reasons for Location Selection

Location Identifier	Physical Location	Sample Logic
Surface Water		
KR-1	Cache Creek, upstream of mill and tailings pond	Background surface water quality
KR-4N	North Dam seepage pond discharge	Surface discharge to Cache Creek
KR-5	South Dam seepage pond discharge	Surface discharge to Cache Creek
KR-8	Cache Creek downstream of seepage ponds	Water quality in Cache Creek
KR-9	Tailings pond	Tailings water quality
Groundwater		
P90-7A	South Dam	Completed in dam
P90-7B	South Dam	Completed in bedrock
P90-7C	South Dam	Completed in native outwash gravels
P90-8	Knoll between dams	Completed in native outwash gravels
P90-9	Knoll between dams	Completed in native outwash gravels
P96-11A	North Dam	Completed in bedrock
P96-11B	North Dam	Completed in native outwash gravels
P96-11C	North Dam	Completed in dam
P96-12A	South Dam	Completed in bedrock
P96-12B	South Dam	Completed in native outwash gravels
P96-12C	South Dam	Completed in dam

3.0 CLOSURE

This information has been prepared for Ketz River Holdings Inc. for the purposes of providing supporting information to their Type A Water Licence application. The information provided is based on reports and data provided by others. Where possible this information has been verified through the review of supporting documentation.

Respectfully Submitted,
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4.0 REFERENCES

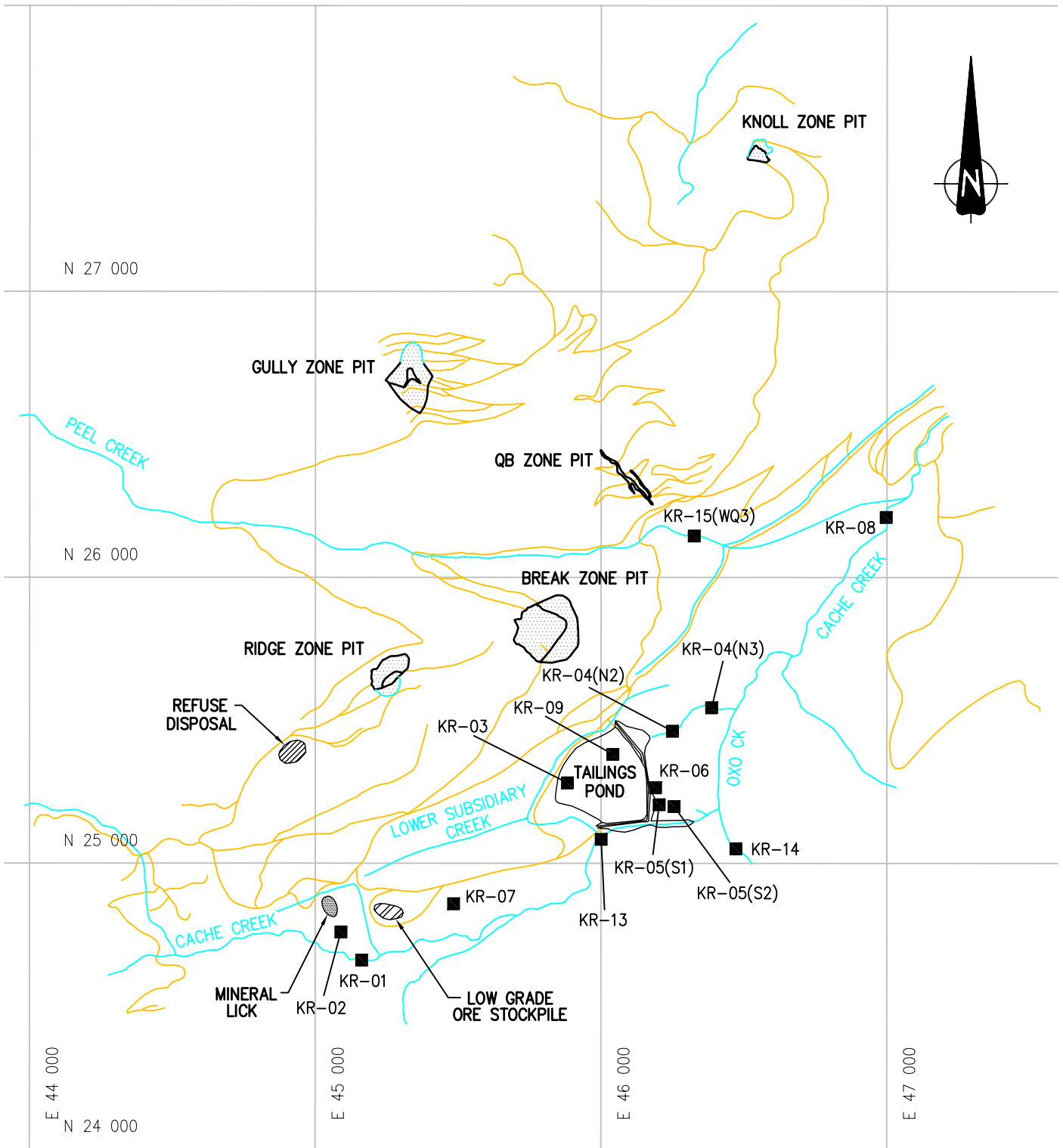
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Figures



LEGEND:

- MINE ROADS
- WATER QUALITY MONITORING SYSTEM

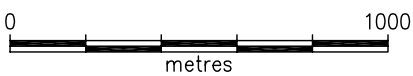


Figure 1

General Site Layout

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