MEMORANDUM

To: Kevin Inouye (CEAA) **Date:** 29 November 2016

From: Michal Wypych, Chief Mine Engineer

Subject: Response to Ajax Project Application/EIS Comment Number CEAA 038.1

Introduction

This memo has been prepared in response to the CEAA Information Request 038.1 regarding the alternatives assessment for avoidance of impacts to Jacko Lake. This request is a follow-up request to CEAA Information Request 038.

CEAA Information Request 038.1

The alternatives assessment does not include consideration of the originally proposed preferred design option presented in 2011. The original design involved only a partial loss of the Mine Bay Arm (North East Arm) of Jacko Lake. When the project was revised in 2014, this option was replaced with the loss of the entire Mine Bay Arm of Jacko Lake. To support the proponent's assertion that avoidance of impacts to Jacko Lake is not possible, conduct an alternatives assessment and provide the results that include consideration of this original design with only a partial loss to the Mine Bay Arm of Jacko Lake.

KAM Response

KAM acknowledges the requirements to determine if impacts to fish, fish habitat or CRA fisheries are unavoidable before proceeding with a proposed offsetting proposal. Through the alternatives assessment presented in the Application/EIS, KAM is of the opinion that the impacts to Mine Bay are unavoidable due to the need to maximize the extraction of the resource to enable economic feasibility of the Ajax Project and geotechnical stability and safety requirements. KAM has reviewed the various open pit limit scenarios presented for the Project since 2011. Three scenarios were reviewed, open pit limits shown in the 2011

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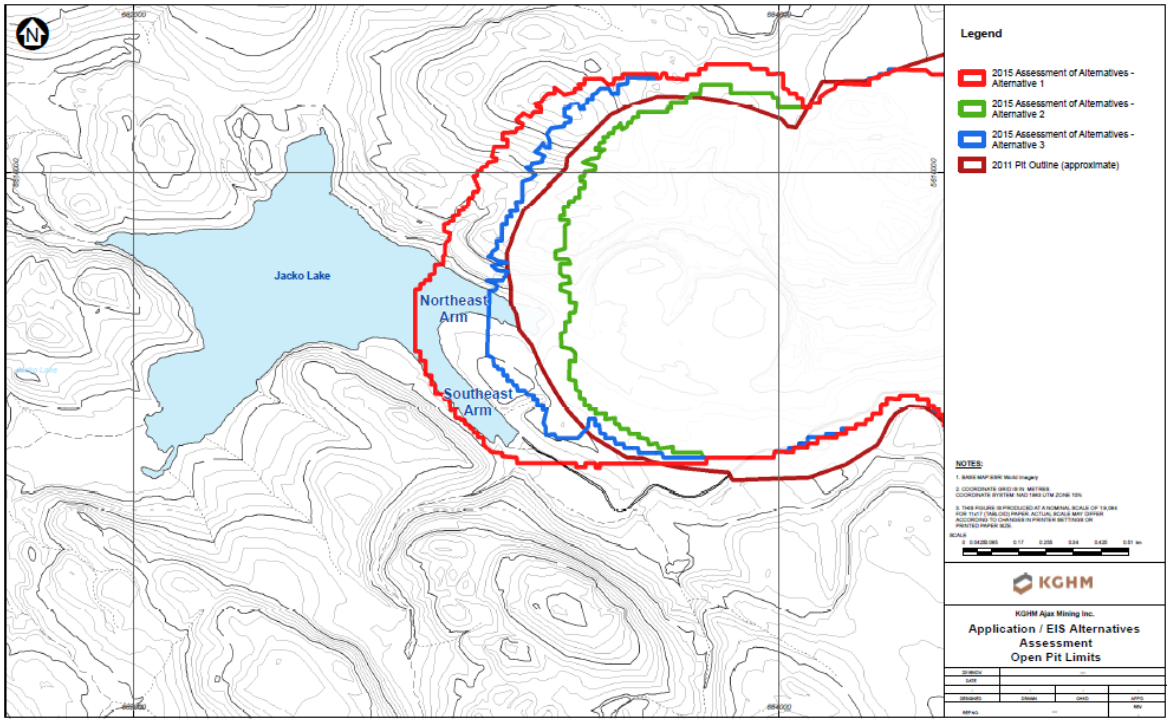
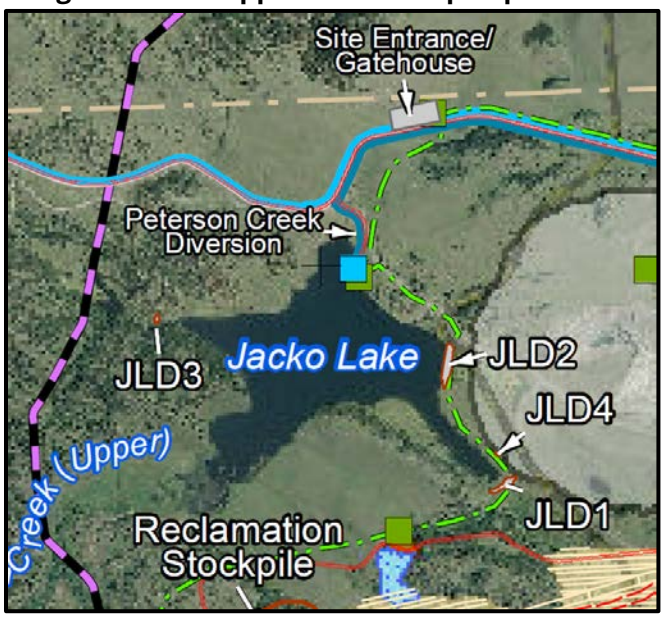
Project Description submitted to the BC EAO (Section 5.3.1)[1], 2015 Environmental Assessment Certificate Application/Environmental Impact Statement for a Comprehensive Study (2015 Application/EIS) (Section 2.2.3), and Assessment of Alternatives as part of the 2015 Application/EIS (Section 17.4.6.1). The following figures present configurations of the open pit relative to the northeast arm of Jacko Lake for each scenario.

Figure 1. 2011 and 2015 Assessment of Alternatives pit limits.



[1] "Project Description for the proposed Ajax Project dated Jul 6/11" filed on BC EAO e-PIC website.

Figure 2. 2015 Application/EIS open pit limits.



The 2011 and 2015 open pit configurations are not identical. Since 2011, KAM has advanced the technical (geological, geotechnical, metallurgical, design) and economic understanding of the orebody such that the design basis has materially changed. In addition, many of the inputs to the economic model such as commodity prices, mining costs, exchange rates, etc. have changed between 2011 and 2015 that result in different feasibility thresholds. As a result of these changes and to ensure resource maximization, the 2015 pit limits have expanded from the 2011 configuration in the area between the northeast and southeast arms of Jacko Lake. To maintain continuous and realistic mining shapes, the pit limits within the northeast arm of the lake also required expansion. Nonetheless, Figure 1 shows that both the 2011 and preferred 2015 open pit limits partially enter the northeast arm of Jacko Lake. Perhaps most important, the 2011 open pit configuration did not include the design of a dam required to provide the geotechnical offset between the lake and the open pit for stability. This dam design if included would result in additional encroachment into mine bay of Jacko Lake.

The 2011 Project Description did not provide details regarding the overall water management strategy or an approach specific to management of the Jacko Lake and open pit interaction. Instead, Section 5.3.11 of the 2011 Project Description only committed to developing a water management plan. The Project presented in 2011 was at the conceptual stage only.

Subsequent to the 2011 general arrangement, KAM has taken steps to optimize the Project with respect to safety, Aboriginal, public, environmental, and economic considerations through trade-off studies and most recently a Basic Engineering phase, completed in 2015. The addition of a dam to the northeast arm of Jacko Lake (JLD2 in Figure 2) is a another reason that the northeast arm of Jacko Lake is further impacted in the 2015 design relative to the 2011 design. The addition of JLD2 (one of four dams proposed for Jacko Lake) was required to ensure safe operations of the open pit by containing anticipated probable maximum precipitation within Jacko Lake during extreme storm events. JLD2 requires an appropriate geotechnical stability offset[2] from the pit limits which was informed through the work completed since 2011. As a result, any pit limit alternative which enters the northeast arm of Jacko Lake will require a structure to control storm events such that open pit operations can be conducted in a safe manner as required by the BC *Mines Act* and the Health, Safety and Reclamation Code for Mines in British Columbia. Therefore, KAM is of the opinion that any open pit configuration which does not completely avoid Jacko Lake will require removing most of the lake's northeast arm.

The Alternatives Assessment presented in Section 17.4.6 of the 2015 Application/EIS and shown in Figure 3, considers the three most realistic alternatives for developing the Project. The alternatives evaluated include:

- Alternative 1 – unconstrained pit infringement on Jacko Lake;
- Alternative 2 – constrained pit completely outside of Jacko Lake;
- Alternative 3 – constrained with minimal infringement on Jacko Lake requiring removal of northeast arm.

As outlined in Section 17.4.6, and in our initial response to IR# CEAA-038, Alternative 3 was selected as the preferred alternative. This alternative has extents of the open pit limits relatively close to those presented in the 2011 Project Description.

It is also worthwhile to note that if an alternative that retains a portion of Mine Bay, residual effects of the Project (e.g., project related noise, blast vibrations, dust deposition, and visual impacts that may decrease recreational enjoyment and fishing experience) would be greatest in that area closest to mine operations. As outlined in *0706_KAM_Fish Habitat and Fishery Offsetting Plan*, KAM has proposed a plan that will fully offset the loss of habitat in Mine Bay, and will provide at least equivalent habitat on the other side of the lake (West Arm), where these residual effects would be least.

[2] Refer to supplemental memo *0427_KAM_Jacko Lake Prelim Pit Slope Offset*

In summary, based on the context provided above, the Project design, as outlined in the 2011 Project Description has been superseded by refined mine planning, geotechnical information and engineering design - in particular the additional water management infrastructure that is required to ensure the pit operations can be safely conducted. Further alternatives analysis between the current proposed pit extent, and that from 2011 would not result in change to the Project that would meaningfully avoid or reduce impacts to fish and fish habitat, or recreational and Aboriginal fisheries at Mine Bay. KAM is of the opinion that impacts to Mine Bay are unavoidable and therefore KAM has proposed an offsetting plan that will fully offset the loss of Mine Bay as described in the supplemental report *0706_KAM_Fish Habitat and Fishery Offsetting Plan*.