Rev. 0

Ajax Project
NI 43-101 Technical Report
Feasibility Study Update

British Columbia, Canada

Effective Date: February 19, 2016

Qualified Persons:

Keith D. Dagel, PE
Daniel Roth, PE, P.Eng
Sean Ennis, P.Eng
Danny Tolmer, P.Eng
Derek C. Chubb, P.Eng
Christopher J. Wild, P.Eng
Claus Stoiber, PE
Julian Watson, MAusIMM CP, (Geotech) RPEQ
Jian (James) Yue, P.Eng
Emir Mehmedbegovic, P.Eng
Peyman Rahmatian, P.Eng
Maz Laylabadi, P.Eng
Stephen Farmer, P.Eng

Date and Signatures Page

This report is effective as of 19 February 2016. See Appendix A, Feasibility Study Contributors and Professional Qualifications, for certificates of qualified persons. These certificates are considered the date and signature of this report in accordance with Form 43-101F1.

AJAX PROJECT
FORM 43-101F1 TECHNICAL REPORT

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1 Executive Summary

1.1 Introduction

M3 Engineering & Technology Corporation (M3) of Tucson, Arizona was contracted by KGHM Ajax Mining Inc. (KAM) to prepare an updated Technical Report compliant with National Instrument 43-101 (NI 43-101) on the Ajax Project. The Ajax Project is 100% owned by KGHM Ajax Mining Inc., a joint venture company owned by Abacus Mining and Exploration Corp. (20%) and KGHM Polska Miedz S.A. (KGHM S.A.) (80%).

The Ajax Project is a potential mining project in south-central British Colombia, Canada that will consist of an open pit, mine rock storage facilities, a processing facility and truck shop, a fresh water intake and pipeline, and a tailings storage facility. The Ajax process plant is designed to treat 65,000 tonnes per day (t/d) of a copper-gold ore, producing approximately 250,000 dry tonnes of concentrate per year grading 25% Cu and containing approximately 14.65 g/t Au.

KAM selected M3 and other third parties to prepare mine plans, resource and reserve estimates, process plant designs, and to complete environmental studies and cost estimates used for this Report.

Comparing to a 2012 Feasibility Study, several significant changes to the project scope have been included in this study for improving environmental, social and economic impacts. This report describes the updated project scope and updates the overall project capital and operating costs.

The key improvements to the project are:

1. Project site relocation from the north to the south side of the mine pit
2. Change in tailings deposition method to thickened tailings
3. Change of mining plans and the replacement of the in-pit semi-mobile crushing stations with a single, fixed primary crushing station
4. Addition of a fine ore stockpile
5. Adjustments to the site water management plan to accommodate facility relocation and tailings storage facility (TSF) redesign
6. Increase in plant throughput from 60,000 t/d to 65,000 t/d
7. Further definition of mineral resources and mineral reserves

A site layout is shown in Figure 1-1 on the following page.

1.1.1 Units of Measurement

Unless otherwise specified, all costs are expressed in US dollars. Measurements are provided in the SI metric system.

1.1.2 Report Contributors

The following consultants contributed to the engineering effort and report preparation:

- M3 Engineering & Technology Corporation (M3) – Revised capital cost estimate, financial modeling, fresh water system, and lead author of 43-101 report.
- Fluor Corporation (Fluor) – Basic Engineering phase Capex, Recovery methods, Overall engineering management, processing plant and associated buildings, facilities and infrastructure. Power supply, distribution and communication.
- KGHM Ajax Mining Inc. (KAM) – History, geology, mineral resources estimate, mineral processing, pit geotechnical design criteria, and metallurgical testing.
- Golder Associates Ltd (Golder) – Mineral Reserve Estimate and Mine Planning.
- Norwest Corporation (Norwest) – Tailings deposition, tailings storage facility, water management of TSF, North seepage collection pond 1 and 2, EMRSF collection pond, mine rock storage facility geotechnical assessments, Jacko Lake dams and Peterson Creek downstream pond.
- ERM Consultants Canada Ltd. (ERM) – Environmental permitting and social/community impacts and interaction.

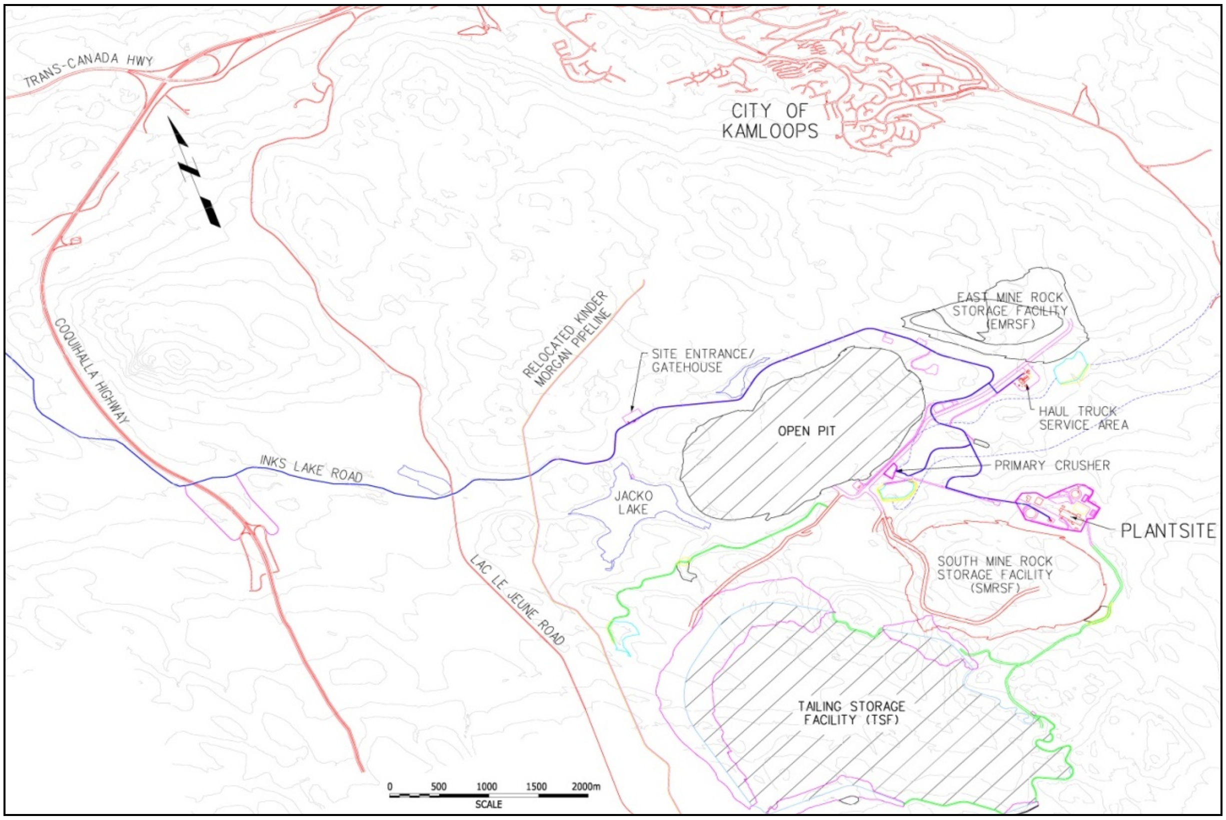


Figure 1-1: Site Layout

1.1.3 Purpose of Report

This report represents an update to the Ajax project feasibility study previously performed by Wardrop and continued by Fluor as a feasibility study update and a basic engineering phase and describes the work performed during this engineering phase.

The primary purpose of this engineering phase was to:

- Incorporate the relocation of facilities from original north location plan to revised south layout and associated land acquisitions
- Update the mine plan and make adjustments to the location of mine infrastructure to reflect change in facility layouts
- Update resource and reserve numbers
- Update slope stability analysis incorporating geotechnical drilling and testwork have been performed and incorporated in the mine plan
- Update project capital and operating costs, incorporating scope changes and improving estimate accuracy to the required engineering level
- Advance project engineering efforts to a completion level of approximately 35%
- Perform a detailed Class of Facilities exercise that would set the basis for the project design criteria and impact project costs
- Execute selected trade-off studies
- Produce an engineering report that will serve as a basis for the next phase of the project.

The main engineering activities executed during this phase aimed to update project capital cost and operating costs are as follows:

- Reviewing and optimizing mining and processing operating costs
- Changing the processing throughput from 60,000 t/d to 65,000 t/d
- Updating the mine plan based on revised throughput and block model, incorporating recent drilling results and recent metallurgical testwork
- Performing a Class of Facilities exercise and incorporating its decisions
- Optimizing the process plant footprint based on new project parameters
- Changing the haul truck maintenance complex layout
- Relocating and changing the size of some facilities
- Incorporating the outcomes of three key trade-off studies:
  - Dual pinion vs. gearless ball mill drives
  - IsaMills vs. Vertimills
  - Thickened vs. unthickened tailings.

The basic engineering phase was executed between March 2015 and September 2015. In order to arrive at the desired level of estimate accuracy, over 50 equipment, materials and service packages were prepared, issued to selected suppliers, and evaluated for inclusion in the project scope and cost.

Over 1,200 engineering deliverables (drawings, PFDs, P&IDs, etc.) were issued as part of this engineering effort.

1.1.4 Trade-off Studies

The project team performed a number of selected trade-off studies that were incorporated into the project scope, as follows:

1. Best available technology (BAT) tailings evaluation (thickened tailings selected)
2. Gearless Mill drive (GMD) vs. dual pinion driven ball mill motors (pinion selected)
3. IsaMills vs. Vertimill for primary regrind system (Vertimill selected)
4. Throughput trade-off study of 60,000 t/d vs. 65,000 t/d (65,000 t/d selected)
5. In-pit crushing and high angle conveying vs. trucking (trucking selected)
6. High-level alternative location assessment for tailings storage facility (south location selected).

1.1.5 Block Model Update & Mine Plan

The block model update included increased geological interpretations and recent drilling results that formed the basis of the current mine plan. The recent mine plan incorporates a fixed primary crusher located outside of the pit, increased throughput to 65,000 t/d, recent metallurgical test results, and updated economic factors.

A slope stability analysis was performed and the geotechnical drilling and testwork was incorporated into the mine plan.

1.2 Project History

Exploration and production in the project area can be traced back over 100 years with exploration in the project area beginning in the 1880s and continuing to the present. Copper, gold, and iron mineralization was discovered at the Iron Mask Mine near Kamloops in 1896. Nearby properties, including the Wheal Tamar, Ajax, and Monte Carlo claims were explored in the following years.

Claims in the project area include Afton, Karen, Galaxy, Lucky Strike, Rainbow, Rogers, No. 7, Ajax, Gold Plate, Windsor, Buda, Lone Tree, Iron Mask, Iron Cap, Crescent, Winty, DM, Ned, Cliff, and Big Onion. Copper and gold are the main deposits of interest in the area.

In the project area, underground exploration began on the Wheal Tamar claim in 1898; development work was completed on the Monte Carlo claim as early as 1905 and on the Ajax claim in 1906. Exploration continued in the Wheal Tamar, Ajax, and Monte Carlo areas, becoming sporadic after 1914.

In 1928, the Consolidated Mining and Smelting Company of Canada Ltd. obtained options on claims in the project area and completed surface drilling on the Ajax and Monte Carlo claims. In 1952, the Ajax property was optioned to Berens River Mines Ltd. In 1954, Consolidated Mining and Smelting Company of Canada Ltd. and its successor, Cominco Limited, entered into option agreements with various clam owners and explored the area until 1980.

Large-scale mining production from the Iron Mask batholith has come from five open pit deposits: Afton, Ajax East, Ajax West, Crescent and Pothook. In the 1980s, Afton Operating Company (majority owned by Teck Cominco) defined the Ajax mineral resource. Mining operations were initiated by Afton in 1989 on the Ajax East and Ajax West claims and subsequently suspended in 1991 due to depressed metal prices. A second period of production began in 1994 and was again suspended in 1997. During these periods of production, 13 Mt of ore from Ajax east and west pits was milled at the old Afton mill facility. The tailings storage facility (TSF) and project components were decommissioned by Afton in accordance with their closure plan, which included maintenance requirements for dams, hydraulic structures and appurtenances to ensure that they are safe and stable. The historic Afton mine site, including the mill building and deactivated and decommissioned TSF, is situated 10 km west of the project. In June 2012, New Gold Inc. opened the New Afton mine, exploiting the remaining Afton ore body below the historic pit by underground methods and utilizing a newly constructed process facility and TSF.

In 2002 and 2004, Abacus Mining and Exploration Corp. (AME) signed option agreements with Teck and Discovery Enterprises Corp. to earn a 100% interest in 52 mineral claims and 20 patented claims, which encompass the Crescent and Ajax pits.

In June 2009, AME completed a National Instrument (NI) 43-101 compliant positive Preliminary Assessment Technical Report on the Ajax property, after a series of successful drill programs from 2005 to 2008. The Technical Report indicated the potential for a robust mining operation capable of processing 60,000 t/d of ore.

KGHM Ajax Mining Inc. (KAM), a joint venture between KGHM Polska Miedź S.A. (KGHM S.A.) and Abacus Mining and Exploration Corporation, was established in June 2010 following KGHM S.A.'s acquisition of a 51% ownership stake in the Ajax Project. In April 2012, KGHM S.A. exercised their option to increase ownership in the project to 80%.

In January 2012, the Project Feasibility Study Technical Report was completed (Wardrop 2012). This was submitted as a Technical Report with Canadian Securities Regulatory Authorities pursuant to NI 43-101, Standards of Disclosure for Mineral Projects. The feasibility study and the resulting economic evaluation recommended that the Ajax Project proceed to the Detailed Engineering Design stage.

Subsequent to the release of the Project Feasibility Study Technical Report in January 2012, KAM re-evaluated the project design previously outlined in the Wardrop document. The project subsequently revised the tailings disposal method and location of the Tailings Storage Facility. Furthermore, the project looked to move previously planned facilities further from the city of Kamloops. The changes in the project related to feedback from the local community, Aboriginal Groups, and regulators. During the period from the submittal of the January 2012 Project Feasibility Study Technical Report and the date of this report, further engineering works were undertaken by KAM to develop and evaluate the project for the new Ajax South layout. This report outlines the updated project and updates a National Instrument 43-101 technical report for the new project scope and layout.

1.3 Deposit Geology

Ajax is an alkalic copper-gold porphyry deposit hosted within the Iron Mask Batholith. Mineralization extends to depths exceeding 700 m, widths exceeding 1,000 m, and has a strike length that exceeds 2,000 m. The mineralization in the project area is associated with structural corridors of highly fractured and albite-altered sections of Sugarloaf Diorite (SLD) and Sugarloaf Volcanic Hybrid (SVHYB) units.

Chalcopyrite is the dominant copper mineral and occurs as veins, veinlets, fracture fillings, disseminations and isolated blebs in the host rock. This mineralization appears to have greater concentration within the Sugarloaf units near the contact with the Iron Mask Hybrid (IMH) unit. Accessory sulphide minerals include pyrite and molybdenite.

Gold mineralization is common and has a significant correlation with copper, but is very fine-grained and visible gold has not been observed in the core. Gold mineralization increases slightly in areas where strong albite alteration occurs.

Minor palladium mineralization is associated with copper near the contacts of the IMH and SLD units. Minor amounts of silver have also been found.

1.4 Mineral Resources

During the period between 2012 and March 2015, the resource block model was reconstructed and modified as new data were added to generate a robust Mineral Resource Estimate (MRE). The MRE was generated using drill hole sample assay results and an interpretation of the geologic model (which relates to the spatial distribution of copper and gold). The mineral resource database is a sub-set of the Ajax database and consists of 208,050 m of drilling in 665 drill holes.

The modelling of the mineralized zones was undertaken in Datamine® and MineSight® mining software packages using conventional sectional interpretation (north-south oriented sections). The approach was to outline continuously developed grade zones with a nominal 0.1% copper (Cu) cut-off. The spatial distribution of gold-silver (Au-Ag) in relation to Cu shows a reasonably strong correlation among the three metals, allowing Cu-Au-Ag to be grouped in mineralized domains. Three separate domains of Cu-Au-Ag mineralization (Domains 10, 11 and 12) and two domains of internal waste (Domains 20 and 21) were interpreted.

The uniformity of the core sample lengths allowed the use of assay samples for the estimate without compositing. A statistical analysis of the data for each domain was done to determine outliers in the assay data, followed by an examination of the spatial distribution of these high-grade values. Bulk density data were collected during the period of 2006-2008. No additional measurements were added to the density model for the 2015 block model update.

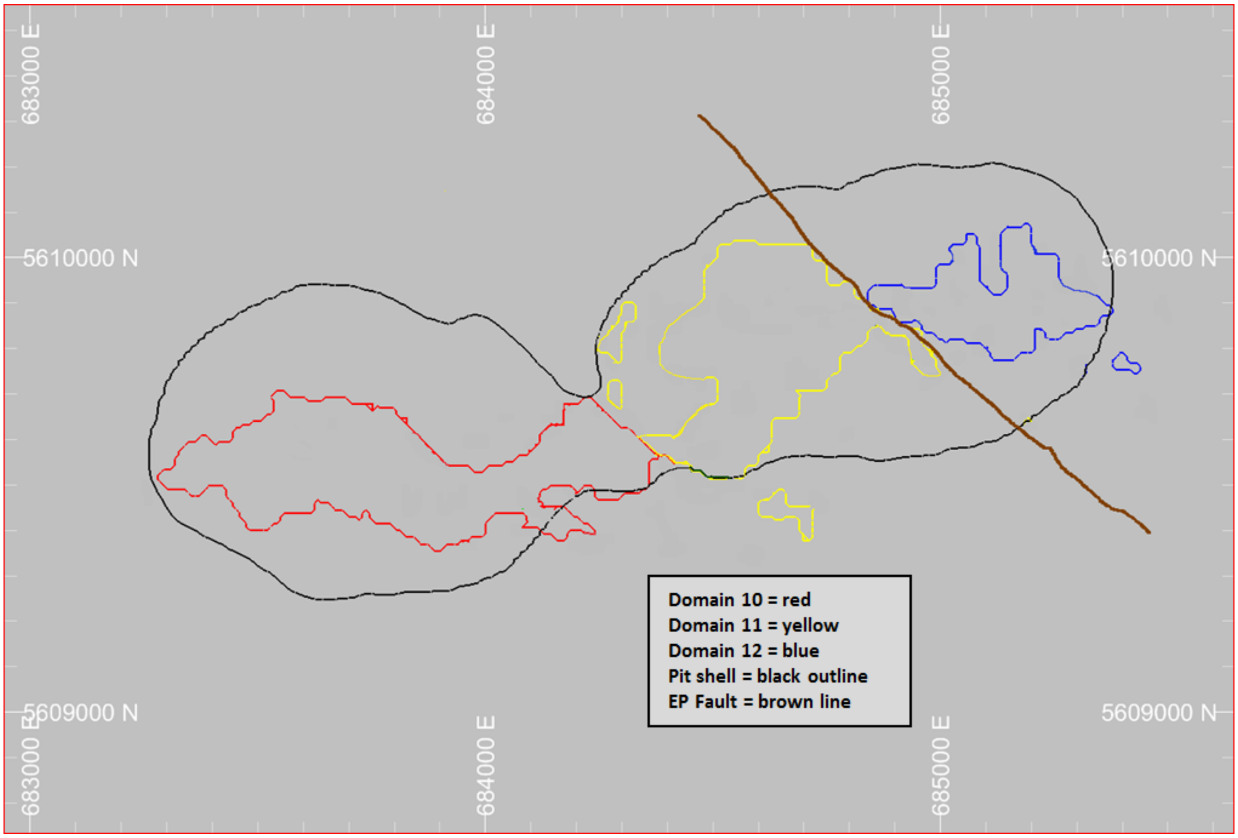


Figure 1-2: Plan View Showing Interpreted Mineralized Domains at Elevation 750 m RL

Variography for each mineralized domain was of poor quality (noisy or unstable variograms). The best-fit models provided a direction of greatest continuity that roughly corresponded to the strike and dip of the mineralized zones. The search strategy was therefore based primarily on the drill hole spacing and the geometry of the deposit.

The block model was initialized in Datamine's Studio 3® resource modelling software with model blocks coded from the cross sectional interpretations. Block model grades for copper, gold and silver were estimated using Inverse Distance Weighting (IDW) of length-weighted capped sample assay data. Inverse Distance to the power of 4 (ID4) interpolations proved the most accurate when compared statistically and spatially to the drill data estimates.

The mineral resource block model was adjusted adding several new items to convert it into a mining model. In order to verify the generation of the pit shells that define the final pit limit as well as the mining phases of the deposit, the block model was coded using the defined slope zones, inter-ramp slopes angles, and required berm widths. Finally, the total economic value per block was calculated for use in the application of the Lerchs-Grossmann (LG) algorithm in the pit shell generation process.

A total net smelter return (NSR) was calculated by adding the NSR attributable to copper to the NSR attributable to gold to the NSR attributable to silver and then subtracting the freight costs, which include land freight, port charges, ocean freight, penalties and other miscellaneous costs.

Table 1-1: Mineral Resource Summary – NSR Cut-off of US $7.10/t Ajax Project

Classification	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)
Measured (M)	148	0.28	0.18	0.37
Indicated (I)	420	0.25	0.18	0.35
M + I	568	0.26	0.18	0.35
Inferred	29	0.13	0.09	0.17

Notes: **1.** CIM Definitions were followed for Mineral Resources. **2.** Mineral resources are estimated at an NSR cut-off of $7.10. **3.** Mineral resources are estimated at US$4.00/lb Cu, US$1800/oz. Au, and US$26/oz. Ag. **4.** Inferred blocks were included in generating pit shell. **5.** Mineral resources are reported inclusive of mineral reserves. **6.** Tonnages and grades are rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding. **7.** Mineral resources that are not mineral reserves do not have demonstrated economic viability.

1.5 Mineral Reserves

To estimate the mineral reserves, mining and milling parameters were taken into consideration. For instance, modifying factors such as mining dilution and losses were estimated. Pit slope design and pit wall depressurization recommendations for the proposed Ajax open pit were incorporated. Mining and processing costs per tonne were estimated and process recoveries were included in the NSR calculation for each of six common metallurgical zones. The Mineral Reserves Estimate is summarized in Table 1-2.

Table 1-2: Ajax Project Mineral Reserves Estimate – NSR Cut-off of US$7.10/t

Confidence Category	ROM (Mt)	Average ROM Grades			Contained Metal		
		Cu (%)	Au (g/t)	Ag (g/t)	Copper (Mlb)	Gold (koz)	Silver (koz)
Proven Mineral Reserves	130	0.30	0.19	0.40	875	791	1,677
Probable Mineral Reserves	296	0.28	0.19	0.38	1,818	1,813	3,615
Proven & Probable Mineral Reserves	**426**	**0.29**	**0.19**	**0.39**	**2,693**	**2,605**	**5,292**

Notes: **1.** CIM Definitions were followed for Mineral Reserves. **2.** Mineral Reserve are estimated at an NSR cut-off of $7.10. **3.** Mineral Reserve are estimated based on long term metal prices of US$3.21/lb Cu, US$1200/oz. Au, and US$17/oz. Ag. **4.** Inferred blocks were included as waste blocks in generating the economic pit shell. **5.** Process recoveries for the six common metallurgical zones are included in the NSR estimation. **6.** Tonnages and grades are rounded to reflect the accuracy of the estimate, and numbers may not sum correctly due to rounding.

1.6 Mining

The proposed mine plan envisages a conventional open pit operation producing 65,000 t/d of ore to the processing facility. The pit has been designed to be developed in seven phases. The ultimate pit will be approximately 2.7 km in an east-west direction and approximately 1.3 km in a north-south direction.

The mine plan is based on the extraction of 426 Mt of ore for processing during 18 years of operation at an overall stripping ratio of 2.65:1 waste to ore. Total material movement from the pit during the life of the mine is estimated at 1,556 Mt. The average head grade of process feed for the life of mine (LOM) is 0.29% Cu, 0.19 g/t Au, and 0.39 g/t Ag.

Two stockpiles will be utilized to maximize the discounted cash flow of the project. A mid-grade stockpile and a low-grade stockpile will be constructed to store lower grade ore and will be reclaimed and processed later in the mine life.

A conventional truck and shovel fleet will be used to mine 15 m benches. Drilling and blasting will be required. Horizontal drains are proposed as the primary means to depressurize the pit slope. In-pit water will be removed by way of ditches, pipes, sumps, pumps, and booster pumps.

Four mine rock storage facilities (MRSFs) for waste rock are planned for the Ajax Site. The east mine rock storage facility (EMRSF) will be constructed east of the ultimate pit. Similarly the south mine rock storage facility (SMRSF), will be located south of the ultimate pit. The tailings embankment will be constructed in two parts using run-of-mine rock, the north and east sections. A north extension and buttress for the main tailings embankment called the west mine rock storage facility (WMRSF) will be constructed to increase storage capacity, reduce haul costs, and to increase the stability of the TSF Embankment. A backfill storage facility is also planned once Phase 6 of the interim pit phases has been completed.

1.7 Recovery Methods

The Ajax process plant is designed to process 23,725,000 dry tonnes of a copper-gold ore annually, or 65,000 t/d, producing approximately 250,000 dry tonnes of concentrate per year. The process design allows to produce a combined copper-gold concentrate at 25% Cu and 16.4 g/t Au.

The unit processes selected were based on the results of metallurgical testing performed at ALS Metallurgy (formally G&T Metallurgical Services Ltd), FLSmidth, along with resources set out by KGHM. Section 13.0 presents the historical and the most recently completed testwork review for the Ajax mineralization. The overall project recovery for copper is expected to be 85.9%, while gold recovery is predicted at 85.1%. The metallurgical processing procedures selected for the design is capable of producing a saleable high-grade copper concentrate containing by-product gold.

The processing plant will consist of stage-wise crushing and grinding, followed by flotation processes to recover and upgrade copper from the feed ores. A gravity circuit will be included within the flotation circuit to enhance overall gold recovery. As shown in the simplified block diagram (Figure 1-3), the flotation concentrate will be thickened, filtered, and sent to the concentrate stockpile for loadout and subsequent shipment to smelters.

The final flotation tailings will be thickened and pumped into a tailings storage facility (TSF). Main process water will be recovered from the tailings thickener overflow in conjunction with reclaimed water from the barge at the tailings pond in TSF to the plant. Fresh water will be used for pump gland seal service, reagent preparation, and process water makeup.

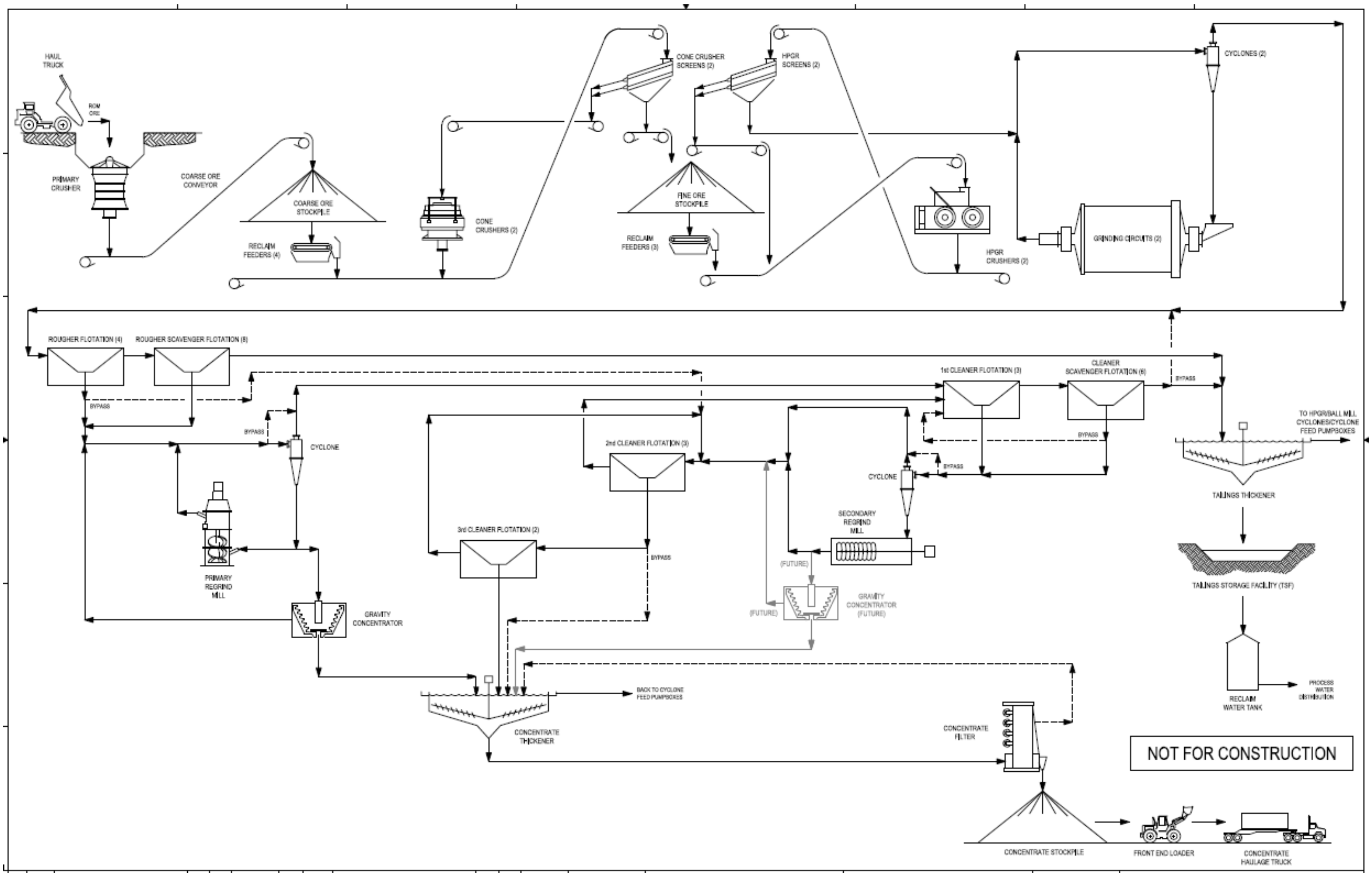


Figure 1-3: Simplified Plant Block Diagram

The process plant will consist of the following unit operations and facilities:

- Run-of-mine (ROM) ore receiving and primary crushing
- Covered coarse ore stockpile
- Coarse ore stockpile reclaim
- Secondary crushing circuit incorporating cone crushers
- Covered fine ore stockpile
- Fine ore stockpile reclaim
- Tertiary crushing circuit incorporating HPGRs
- Ball mill grinding circuit incorporating cyclones for classification
- Rougher and scavenger flotation
- Primary regrind
- First cleaner and cleaner scavenger flotation
- Secondary regrind
- Second and third cleaner flotation
- Copper concentrate dewatering circuit
- Final tailings thickening, pumping, and water recycle.

1.8 Tailings Storage Facility & Other Infrastructure

1.8.1 Services & Facilities

The Ajax Project is situated approximately 3 km south of the City of Kamloops, BC. The project will be accessed from the Coquihalla Highway via a reconstructed Inks Lake Interchange and upgraded mine access road along the historic haul road, crossing Lac Le Jeune Road to the main gate east of Jacko Lake.

Makeup fresh water to the mine site will be pumped from Kamloops Lake to the project site. Section 18.5 provides the detailed information regarding fresh water supply. It should be noted that the majority of the water used in process will be reclaim water.

Power to site will be supplied by a single circuit 230 kV transmission line from BC Hydro Jacko Lake substation located approximately 12 km from project site. Refer to Section 18.6 for the site power supply details.

For more information regarding project infrastructure, including access and site roads, buildings and facilities, refer to Section 18.

In general, a list of services and facilities is as follows:

- Mining and mining related maintenance facilities
- Tailings storage facility
- Mine rock storage facilities

- Fresh water supply
- Water management
- Power supply (BC Hydro) and distribution
- Ore handling and processing facility
- Infrastructure facilities
- Natural gas pipeline (Fortis).

1.8.2 Building Structures

The following building structures are planned for the project:

- Primary crusher station, dust enclosure and control room
- Covered coarse ore stockpile and reclaim tunnel
- Secondary and tertiary crushing building and control room
- Covered fine ore stockpile and reclaim tunnel
- Conveyor support structures complete with drive stations and take-ups
- Process plant building, including dry, offices and central control room
- Tailings thickening
- Compressor building
- Administration building
- Gatehouse
- Truckshop, including truck wash, and welding shop
- Truck scale
- Heavy vehicle fueling station
- Light vehicle fueling station
- Reagents storage building
- Assay and metallurgical laboratory
- Storage building
- Mine dispatch building
- Explosive manufacturing facility
- Explosives storage facility
- Potable water treatment plants
- Fresh water booster station no. 2
- Miscellaneous pump houses
- Main substation – E-house and transformers
- Main substation – harmonic filter yard
- Modular electrical buildings and transformers – various locations

- Sewage treatment facilities
- Water storage tanks
- Fire protection pumphouses.

1.8.3 Tailings Storage Facility

Norwest Corporation (Norwest) completed a permit level design for the tailings storage facility (TSF). Section 18.3 provides the information for the TSF design. The TSF was designed with specific reference to the 2015 Mt. Polley commission recommendations as is discussed in Section 18.3.

The thickened tailings will be managed in a TSF located south of the deposit. The TSF is also an integral component of the water management system.

The TSF has been designed to store a total of 440 Mt of tailings (approximately 275 Mm^3 of tailings material), a supernatant pond volume of 2.4 Mm^3 (approximately three months of process water), and storage for a probable maximum flood (PMF) event volume of approximately 4 Mm^3. The TSF will consist of four earth-rockfill dams, the north, east, south and southeast embankments, which will contain tailings and supernatant water. The north and east embankments will be buttressed by mine rock storage facilities constructed against the downstream slopes of the TSF embankment, which are incorporated in the designs from start-up and throughout the life of the facility.

The TSF design includes several design features that significantly improve the stability of the facility, as follows:

- A mine rock buttress and/or mine rock storage facility is included on the downstream of the north and east embankments to increase the Factor of Safety (FOS) against a breach significantly higher than the minimum design requirement.
- Additional freeboard allowance for the PMF volume and wave run-up is included for all stages of dam development.
- Other than during the project start-up period, the design calls for the supernatant pond to be maintained several hundred metres from the dam crest.

1.8.4 Water Management

A surface water management plan was developed to manage contact water on the project site and at the TSF in a manner that supplements make-up water for ore processing while minimizing the potential for storm flows to cause damage to mine structures, and minimizing the potential for mining operations to cause adverse effects to downstream water quality. Water will be controlled to minimize erosion in areas disturbed by construction activities and prevent the release of sediment-laden or mine contact water to the receiving environment. This includes diverting and/or collecting surface water runoff and seepage, constructing sediment control ponds, and managing pump back systems. Non-contact water will be diverted away from mine areas and directed back into the natural environment where practical.

The following seepage and/or runoff collection ponds will be constructed to collect water for re-use in the process:

- North embankment seepage collection pond 1
- North embankment seepage collection pond 2
- Plant site drainage pond
- Central collection pond
- East mine rock storage facility (EMRSF) pond
- South mine rock storage facility (SMRSF) pond

For additional information on the water management system, refer to Section 18.3.

1.9 Marketing

The Ajax Project will produce flotation sulphide copper concentrates with a significant gold and silver credit. It is expected that the concentrates will be trucked from site to a port in Vancouver for shipment to copper smelters in Asia.

A marketing strategy has been developed and is outlined in Section 19.

1.10 Environmental, Social and Permitting Considerations

Environmental studies for the Ajax Project were initiated in 2006, including ground and surface water quality and quantity, meteorology, fish and fish habitat, wildlife, vegetation, air quality, and heritage studies. Discussions have been initiated with government regulatory agencies through the Environmental Assessment (EA) process to develop appropriate avoidance and mitigation approaches. Section 20 outlines the outcomes from the environmental studies completed to date and permitting application status as well as ongoing engagement/consultation activities.

A Project Description was submitted to the BC Environmental Assessment Office (EAO) and the federal Canadian Environmental Assessment Agency (CEA Agency) in early 2011. The Project Description was accepted by EAO on February 25, 2011 and on March 16, 2011 by CEA Agency.

The Ajax Project received a Section 10 order from the EAO on February 25, 2011, stipulating that the project must undergo an Environmental Assessment (EA). The scope and requirements for public consultation were outlined in a preliminary Section 11 in June 2011. A Section 11 order was received on January 11, 2012, providing direction regarding the scope, procedures, and methods for conducting the EA and related consultation.

CEA Agency commenced a comprehensive study on May 25, 2011 and posted a Notice of Commencement on the CEA Agency Registry on May 31, 2011. A project agreement was signed on August 17, 2011. The project is proceeding as a transitional comprehensive study under the amended Canadian Environmental Assessment Act (2012).

The Project Application Information Requirements / Environmental Impact Statement Guidelines (AIR/EISG) document was provided to the EAO and CEA Agency on August 12, 2011 for distribution to the Technical Working Group and was finalized on June 4, 2013. In August 2013, an internal evaluation undertaken by KAM identified opportunities to optimize the project design; this resulted in changes to the project's General Arrangement (GA). The AIR/EISG have been revised to reflect the changes to the project and to ensure that the information required in the Application/EIS satisfies the public's interests and concerns. Following Working Group, Aboriginal groups, and public review, the revised AIR/EISG document was finalized on July 23, 2015. A Section 13 order was also received on July 23, 2015, revising the scope of the project and adding the Whispering Pines/Clinton Indian Band to the consultation requirements.

The Application/Environmental Impact Statement (EIS) was submitted to the Federal and Provincial governments for screening review on September 11, 2015. As of November 20, 2015 the Federal and Provincial Governments had each concluded that the Application/EIS was in conformance with the requirements of the AIR/EISG and could proceed to detailed review. KAM is targeting January 2016 for submission of an updated Application/EIS that incorporates the results of the screening review which will trigger commencement of the detailed review. Permit applications under provincial and federal legislative instruments will be prepared in parallel with the Application/EIS and submitted during the review of the Application/EIS.

The Ajax project's proximity to Kamloops and location within the traditional territories of several Aboriginal groups means heightened interest and concern over land uses such as mining. These public perceptions of the project have affected how the project has been developed to date, and may affect how the project passes through the EA process.

KAM has been actively consulting Aboriginal groups under the EA process, as well as conducting dialogue with a view toward reaching an agreement that considers impacts to Aboriginal rights of, and provides benefits to, the Stk'emlupsemc te Secwepemc Nation (SSN) (an "impact-benefit agreement"). Through these two processes, which has included providing funding to SSN to conduct Cultural Heritage Studies, KAM has come to understand that the SSN has concerns about the location of the project relative to an area they call Pípsell, which is composed of Jacko Lake and surrounding area. The SSN has informed KAM that this area has spiritual, cultural, and historical importance to them; the SSN has cited effects of historic mining activity on this area as the reason why they are concerned about the Ajax project. The SSN is, in parallel with the EA Process, conducting their own assessment process that respects the SSN cultural perspectives, knowledge and history. KAM intends to participate in the SSN Assessment Process by considering and responding to SSN's perspectives, opinions and technical information, including that which may result from the SSN Assessment Process.

In June of 2015, the SSN declared Aboriginal title over Pípsell. If the courts find that the SSN's claim has merit, there are potential implications for the SSN's ability to allow or deny mining to take place in this area. It is not immediately clear when a legal decision will be reached. It is also not immediately clear whether SSN would intend to block mining if its title is recognized.

The SSN claim to Aboriginal title over Pípsell underscores the need for KAM to reach a negotiated agreement with SSN that provides assurance to both parties that the project is welcomed and mutually beneficial.

1.11 Capital & Operating Costs

1.11.1 Capital Costs

The overall capital cost estimated for the project at this phase of development is summarized in Table 1-3.

Table 1-3: Capital Cost Estimate

Cost Item	Total ($M USD)
Project Directs	680.5
Project Indirects	109.2
Contingency	79.0
Subtotal Directs & Indirects	**$ 868.7**
Mining (w/ contingency)	$ 279.4
KAM G&A	$ 85.3
Capitalized Mill Turn Over	$ 32.4
Kinder Morgan Pipeline (w/ contingency)	$ 28.7
BC Hydro Connection (w/ contingency)	$ 12.7
Subtotal Owner's, Mining & Other	**$ 438.5**
Grand Total	**$ 1,307.2**

1.11.2 Operating Cost

The estimated life of mine operating costs are summarized below in Table 1-4.

Table 1-4: LOM Mine Operating Costs

Area	Total Cost ($M USD)	Unit Cost ($/t mined)
Drilling	102	0.07
Blasting	297	0.20
Loading	285	0.19
Hauling	998	0.66
Support	258	0.17
Mine General	325	0.22
Total Cost	**2,265**	**1.50**

Note. Operating costs are excluding costs incurred during construction, commissioning, and ramp-up. Similarly, unit costs are report on a tonnage basis excluding pre-stripping.

The processing operating cost is estimated to be US$4.31/t ore milled. Process operating costs are summarized in Table 1-5.

Table 1-5: LOM Process Operating Costs

LOM Mill Feed @ 426.3 M tonnes		
Area	**Total Cost ($M USD)**	**US$/t ore**
Maintenance	287	0.68
Supplies	733	1.72
Consumables	405	0.95
Outside Service	80	0.19
Salaries & Wages	279	0.64
Taxes	52	0.12
Total	**1,839**	**4.31**

1.11.3 General and Administrative Costs

Key annual administrative costs are given in Table 1-6.

Table 1-6: Administrative Costs

Description	$000/Year	US$/tonne ore
Fire System	8	0.001
Site Administration Services	170	0.013
Environment	698	0.053
Health & Safety	855	0.065
External Affairs/First Nations	333	0.025
Project Team	6,845	0.517
Admin Expenses	3,225	0.244
Financial	8,446	0.638
Corporate Costs	100	
Total	**20,680**	**1.554**

Other administrative and general costs in the cost model include royalties, and offsite concentrate transportation and refining charges.

1.12 Economic Analysis

An economic model has been developed for the Ajax project by KAM in conjunction with M3. The model is based on a 65,000 t/d ore produced from a conventional open pit mine. In the model, the capital costs associated with mine development along with sustaining capital costs during mine operation have been estimated by KAM and M3. The operating cost estimate compiled by KAM consists of four components: mine, processing, General & Administrative, and off site transport, smelter-treatment, and smelter charges.

Summary for the cost and production metrics used for the cost model are included in Table 1-7.

Table 1-7: Valuation Metrics

Valuation Metrics	Units	LOM Total
Revenue	$M USD	$9,806.3
EBITDA	$M USD	$4,158.7
Free Cash Flow, Pre-Tax		
NPV @ 8%	$M USD	$429.4
ROIC		43.9%
IRR		13.4%
Payback Period	Years	6.48
Discounted Payback Period	Years	10.52
Free Cash Flow, After Tax		
NPV @ 8%	$M USD	$215.6
ROIC		22.0%
IRR		11.1%
Payback Period	Years	6.72
Discounted Payback Period	Years	12.20

Cost Summary		LOM Total
OpEx		
Mining Cost	$M USD	$2,265
Process Cost	$M USD	$1,806
G&A	$M USD	$460
Offsite Costs	$M USD	$1,116
Total OpEx	**$M USD**	**$5,648**
Income Taxes	$M USD	$718
CapEx		
Initial Development CapEx	$M USD	$1,307
Undiscounted Sustaining CapEx	$M USD	$358
Total CapEx	**$M USD**	**$1,666**

Mine Operational Metrics		LOM Total
Life Of Mine	Years	18
Mined Volumes		
Total Waste Mined	M tonnes	1,130.2
Total Ore Milled	M tonnes	426.3
Lom Strip Ratio		2.65
Payable Production		
Cu - Copper	Mlbs	2,214.7
Au - Gold	Koz	2,165.7
Ag - Silver	Koz	1,167.2

A discount rate of 8% has been applied to the project over the life of the mine to arrive at an after-tax net present value (NPV) of $215.6 M. The corresponding after-tax internal rate of return (IRR) is 11.1%. The copper pricing used in the analysis is per a variable forecast price which is described in Section 19.3.

The model was compiled using the best available information at the time. Due to risks and uncertainty related to global economic factors, governmental regulations, environmental considerations and other inherent risks associated with a mining project of this size and scale, actual results may differ from those reflected in the model.

1.13 Interpretation & Conclusions

1.13.1 Mine Development

There is sufficient area within the Ajax holdings to support the development of an open pit. Additional ground that hosts the TSF is held through an agreement completed in 2014. It is a reasonable expectation that appropriate surface rights to support project development and operations can be obtained. It is expected that any future mining operations will be able to be conducted year-round.

In the opinion of the mining QP, knowledge of the deposit settings, lithologies, and structural and alteration controls on mineralization is sufficient to support Mineral Resource and Mineral Reserve estimates. The exploration programs completed to date are appropriate to the style of the deposits and prospects within the project. Additional exploration potential remains in the project area.

From the review of the drill programs, the QP concluded that documentation for the drilling campaigns completed in the Ajax area before 1980 is limited or not available. Because of the limited documentation, the pre-1980 drill campaigns were not included in the 2015 resource model database. No factors were identified with the data collection from the drill programs used that could affect mineral resource or mineral reserve estimation. The Ajax deposits have been sampled at drill hole spacing appropriate for a property at this level of development. Because of the irregular shape of the mineralized body, the orientation of the mineralization with respect to drill intercepts is unknown.

In the opinion of the QP, sample collection, preparation, analytical and QA/QC data from the Abacus and KAM drilling programs were appropriate and meet industry standards. The QP concluded that the analytical data can be used to support mineral resource and mineral reserve estimation without limitation. Because of the lack of information for Afton OC and Cominco drilling, AMEC previously compared these drill campaigns to the previous Abacus drilling using paired samples. AMEC concluded that model blocks with grade estimates primarily supported by Afton OC drilling should be limited to an Indicated classification. Model blocks with grade estimates primarily supported by Cominco drilling were limited to an Inferred classification. Recent drilling has provided additional data for some areas of the block model where the resource classification has been adjusted.

The QP consider that a reasonable level of verification has been completed during the audits undertaken in 2008-2009, 2010, 2011 and 2014 by MDA, and that no material issues would have been left unidentified from the audit programs undertaken. The data verification programs undertaken on the data collected from the project adequately support the geological interpretations, the analytical and database quality, and therefore support the use of the data in mineral resource estimation.

In the opinion of the QP, estimations of mineral resources for the project conform to industry best practices and meet the requirements of CIM (2010). An LG pit shell has been used to constrain the mineral resource estimate. Measured and Indicated mineral resources are stated in Table 1-1.

Factors that may affect the geological models or the pit shells used to constrain the mineral resources, and therefore the mineral resource estimates include the following:

- Commodity price assumptions – the NSR value used to constrain the mineral resources is based on technical and economic parameters determined the Ajax 2015 mine planning process; should these assumptions change, then the pit constraining the mineral resources will also change
- Metallurgical recovery assumptions
- Pit slope angles used to constrain the estimates
- SG values assumed for the rock types

In the opinion of the QP, estimations of mineral reserves for the project conform to industry best practices, and meet the requirements of CIM (2010). An economic Lerchs-Grossman (LG) pit shell was used to constrain the estimate and develop a mine design, and appropriate modifying factors were applied to convert Measured and Indicated Mineral Resources to Proven and Probable Mineral Reserves (see Table 1-2).

Factors that may affect the Mineral Reserve Estimate include the following: gold, copper, and silver price assumptions; economic and technical parameters; effectiveness to relocate the Kinder Morgan Canada’s Trans Mountain Pipeline (TMPL), effectiveness of surface and groundwater management, including the modification required to Jacko Lake; the assumption that granting of appropriate environmental and construction permits would be forthcoming from the relevant authorities; unrecognized structural complications in areas with relatively low drill hole density; changes to the proposed methodology for mine rock; and changes to the pit shell shape if the material currently near or under the pit shell is removed or additional ore is incorporated into the pit design.

The proposed mine plan has been developed at a 65,000 t/d ore processing rate. The average head grade of process feed for the life-of-mine is 0.29% Cu, 0.19 g/t Au, and 0.39 g/t Ag. Mining will be accomplished using a conventional truck-and-shovel operation. The proposed mine has an expected mine life of 18 years and an overall stripping ratio of 2.65:1 waste to ore.

1.13.2 Processing Plant Design

The Ajax concentrator has been designed to produce a saleable copper concentrate. The complete processing circuit has been designed according to metallurgical testwork conducted over the years, and the use of proven equipment.

The unit processes selected were based on the results of metallurgical testing performed at ALS Metallurgy (formally G&T Metallurgical Services Ltd), FLSmidth, along with resources set out by KGHM. Section 13 presents the historical and the most recently completed testwork review for the Ajax mineralization. The metallurgical processing procedures selected for the design is capable of producing a saleable high-grade copper concentrate containing by-product gold.

The processing plant will consist of stage-wise crushing and grinding, followed by flotation processes to recover and upgrade copper from the feed ores. A gravity circuit will be included within the flotation circuit to enhance overall gold recovery. As shown in the simplified block diagram (Figure 1-3), the flotation concentrate will be thickened, filtered, and sent to the concentrate stockpile for load-out and subsequent shipment to smelters.

The final flotation tailings will be thickened and pumped into the TSF. Main process water will be recovered from the tailings thickener overflow in conjunction with reclaimed water from the barge at the tailings pond in TSF to the plant. Fresh water will be used for cooling, gland service, reagent preparation, and process water makeup.

1.13.3 Tailings Storage Facility Design

Norwest developed the tailings management design incorporating new metallurgical testwork results on the dewatering and rheological properties of the tailings along with results from the geotechnical investigations completed in 2014 and 2015. The TSF is designed to permanently store approximately 440 Mt of tailings generated during the life of mine. The TSF will consist of four earth rockfill dams—the north, east, south and southeast embankments—in order to contain tailings and supernatant water. The north and east embankments will be buttressed by mine rock storage facilities constructed against the downstream slopes of the TSF, which are incorporated in the embankment designs from start-up and throughout the life of the facility.

The tailings material will be a thickened, non-segregating tailings slurry discharged into a TSF for the Ajax operations, mainly consisting of a conventional cross-valley embankment tailings storage facility and associated supernatant pond.

The flotation tailings from the concentrator will be thickened using flocculants before being pumped to the TSF. Thickener overflow water and TSF reclaim water will be piped to the process water tank for reuse in the milling process.

The TSF embankments will be constructed in a downstream manner and thickened tailings will be discharged from spigot points. Mine rock from the open pit will be used to construct TSF embankments and associated buttresses. Locally sourced overburden suitable for use as a compacted engineered fill will be used to construct the seepage barriers included as part of the TSF dyke design.

At closure, reclamation of the TSF will consist of a closure dry cover placed over the entire tailings surface area. The water in the TSF supernatant pond will be pumped to the open pit until discharge requirements are met and a stable trend in water quality is attained. A channel draining east is planned for construction to allow the reclaimed surface to be “free draining,” with runoff flowing to a nearby stream.

Studies have determined the tailings to be non-acid-generating. Non-acid-generating mine rock will be utilized for the TSF embankment construction.

2 Introduction

2.1 Purpose of the Report

In June 2009, Abacus Mining and Exploration Corp. (AME) completed a National Instrument 43-101 (NI 43-101) compliant positive Preliminary Assessment Technical Report on the Ajax property after a series of successful drill programs from 2005 to 2008. The results of the Technical Report indicated the potential for a robust mining operation capable of processing 60,000 t/d of ore. A completed trade-off study confirmed an increase in the processing rate to 65,000 t/d.

KAM, a joint venture between KGHM Polska Miedź S.A. (KGHM S.A.) and Abacus Mining and Exploration Corporation (Abacus), was established in June 2010 following KGHM S.A.'s acquisition of a 51% ownership stake in the Ajax Project. In April 2012, KGHM S.A. exercised their option to increase ownership in the project to 80%.

In January 2012, an NI 43-101 compliant feasibility study report was completed (Wardrop 2012). This was submitted as a Technical Report with Canadian Securities Regulatory Authorities pursuant to National Instrument 43-101, Standards of Disclosure for Mineral Projects. The feasibility study and the resulting economic evaluation recommended that the Ajax Project proceed to the next engineering design stage.

Subsequent to the January 2012 Project Feasibility Study Technical Report, KAM re-evaluated the project design. The project team subsequently revised the tailings disposal method and location of the TSF, and looked to move previously planned facilities farther from the city of Kamloops, as per feedback from the local community, Aboriginal Groups, and regulators. During the period after the submittal of the January 2012 Project Feasibility Study Technical Report to the date of this report, further engineering was undertaken by KAM to develop and evaluate the project for the new Ajax south layout. This report outlines the updated project and represents an NI 43-101 technical report for the revised project scope and layout.

2.2 Report Preparation & Responsibilities

This report was prepared as a National Instrument 43-101Technical Report for KGHM Ajax Mining Inc. Portions of the Technical Report were authored by the Qualified Persons employed by KGHM Ajax Mining Inc. as identified in those Qualified Persons' Certificates and in Table 2-1. This Technical Report is meant to be read as a whole and sections should not be read or relied upon out of context. The quality of information, opinions, and estimates contained in those sections prepared by is consistent with the intended level of accuracy for a Feasibility Study and is based on:

i. *Information available at the time of preparation,*
ii. *Data supplied by outside sources,*
iii. *The assumptions, conditions and qualifications set forth in this report, and*
iv. *Industry standards for engineering and evaluation of a mineral project. Except for the purposes legislated under provincial securities laws, any other use of this report by any third party is at that party's sole risk.*

v. *Each Qualified Person only assumes responsibility for the section, or sections that were prepared by that Qualified Person. No Qualified Person assumes any responsibility or liability for the sections or areas of this report that were prepared by other Qualified Persons.*

The principal consultants who contributed to the preparation of this report were:

- M3 Engineering & Technology Corporation (M3) – Revised capital cost estimate, financial modeling, fresh water system, and lead author of 43-101 report.
- Fluor Corporation (Fluor) – Basic Engineering phase Capex, Recovery methods, Overall engineering management, processing plant and associated buildings, facilities and infrastructure. Power supply, distribution and communication.
- KGHM Ajax Mining Inc. (KAM) – History, geology, mineral resources estimate, mineral processing, pit geotechnical design criteria, and metallurgical testing.
- Golder Associates Ltd. (Golder) – Mineral Reserve Estimate and Mine Planning.
- Norwest Corporation (Norwest) – Tailings deposition, tailings storage facility, water management of TSF, North seepage collection pond 1 and 2, EMRSF collection pond, mine rock storage facility geotechnical assessments, Jacko Lake dams and Peterson Creek downstream pond.
- ERM Consultants Canada Ltd. (ERM) – Environmental permitting and social/community impacts and interaction.

A summary of the Qualified Persons (QP) responsible for specific sections of this report is provided in Table 2-1.

Table 2-1: Summary of Qualified Persons

Name of Qualified Person	Certification	Company	Site Visit Date	Section Responsibilities
Keith D. Dagel	PE	M3	March 17, 2015	Sections 1.1, 1.8.1, 1.8.2 1.9, 1.11, 1.12, 1.13, 1.14, 2, 3, 18.3.11, 18.3.13, 18.5.1 to 18.5.3, 18.7, 18.8, 19, 21.3 (except 21.3.1), 21.4 (except 21.4.1), 21.5, 21.6, 22, 25.1, 25.3, 25.6, 26.1, 26.3, 26.4, and 27
Daniel Roth	PE, P.Eng	M3	March 17, 2015	Sections 21.1, 21.2 (except 21.2.5) and 24
Sean Ennis	P.Eng	Norwest	October 19, 2015	Sections 1.8.3, 1.8.4, 5.3, 5.4, 16.2.1, 18.2, 18.3 (except 18.3.11, 18.3.13), and 25.4
Danny Tolmer	P.Eng	Golder	May 4, 2015	Sections 1.5, 1.6, 15 (except 15.1.2.5), 16 (except 16.2.1), 21.2.5, 21.3.1, 21.4.1
Derek C. Chubb	P.Eng	ERM	N/A	Sections 1.10, 4.5, 20, 25.5, and 26.5
Christopher J. Wild	P.Eng	KAM	January 14, 2016	Sections 1.2, 1.3, 1.4, 4 (except 4.5), 5.5, 6, 7, 8, 9, 10, 11, 12, 14, 23, 25.2 and 26.2
Claus Stoiber	PE	KAM	April 23, 2015	Section 13
Julian Watson	MAusIMM CP (Geotech), RPEQ	KAM	December 14-17, 2015	Section 15.1.2.5
Jian (James) Yue	P.Eng	Fluor	February 10, 2016	Sections 1.7 and 17
Emir Mehmedbegovic	P.Eng	Fluor	September 18, 2015	Sections 5.1, 5.2, 18.1, 18.5.4, 18.5.5
Peyman Rahmatian	P.Eng	Fluor	February 10, 2016	Section 18.4
Maz Laylabadi	P.Eng	Fluor	N/A	Section 18.6
Stephen Farmer	P.Eng	Fluor	February 10, 2016	Section 18.9

2.3 Terms of Reference

This report has been prepared to define the scope, design and the overall economics of the Ajax Project for KAM.

Unless otherwise specified, all costs are expressed in US dollars (USD or US$). Measurements are provided in the SI (metric) system.

The coordinate system used on the project is Universal Transverse Mercator (UTM) system, Zone 10, with all coordinates given in metres. The plant coordinate datum is taken at UTM coordinate N 5 608 000.00, E 682 000.00. The plant rotation angle is 50° about the plant coordinate datum point.

All drawings related to the plant site will use the plant coordinate system and will include the 50° angle between grid north and plant north.

The main Canadian National and Provincial codes and regulations used in the design work are as follows:

- *BC Safety Act*, Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation
- *BC Mines Act*, Health Safety and Reclamation Code for Mines in British Columbia (HSRC)
- WorkSafe BC Occupational Health and Safety (OHS) Regulation
- British Columbia Building Code
- Canadian Dam Association (CDA), 2013. Dam Safety Guidelines.

Table 2-2 is a list of abbreviations and terms that may be used in this report.

Table 2-2: Units, Terms and Abbreviations

Abbreviation	Meaning
$/t	Dollars per tonne
%	Percent
AA	Atomic absorption
Abacus	Abacus Mining and Exploration Corporation
Actlabs	Activation Labs
Afton	Afton Operating Corporation
Ag	Silver
AIR/EISG	Application Information Requirements / Environmental Impact Statement Guidelines
Albt	Albite
AME	Abacus Mining and Exploration Corporation
ANFO	Ammonium nitrate/fuel oil
Anh	Anhydrite
APL	Aplite
Ar/Ar	Argon/Argon Dating
ARO	Asset retirement obligation
Au	Gold
AWWA	American Water Works Association
BAP	Best Available Practices
BAS	Basalt
BAT	Best Available Technology
BCH	BC Hydro
BE	Basic Engineering
BEA	Bid Evaluation Analysis
BGC	BGC Engineering Inc.
BMA	Bulk Mineral Analysis
BQ	55.6 mm diameter drill bit and rods
CCBX	Cherry Creek Breccia
CDA	Canadian Dam Association
CEA Agency	Canadian Environmental Assessment Agency
Chl	Chlorite
CHMZ	Cherry Creek Monzonite
CIM	Canadian Institute of Mining & Metallurgy
CM&S	Consolidated Mining and Smelting Company of Canada
CNR	Canadian National Railway
COF	Class of Facilities
cp	Chalcopyrite
CPR	Canadian Pacific Railway
CRM	Certified Reference Material
CS	Carbon Steel
CSR	Comprehensive Study Report
Cu	Copper
DDH	Diamond Drill Hole
dmt	Dry metric tonnes

Abbreviation	Meaning
Dol	Dolomite
EA	Environmental Assessment
EAO	Environmental Assessment Office
Eco Tech	Eco Tech Laboratories Ltd.
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMRSF	east mine rock storage facility
EMS	Environmental Management System
EPC	Engineering, Procurement and Construction
EPCM	Engineering, Procurement and Construction Management
ERM	Environmental Resource Management
Fe	Iron
FEL	front-end loader
Fluor	Fluor Corporation
FOS	Factor of Safety
FS	Feasibility Study
ft	feet
Fusion GDMS	Fusion Geological Database Management Solution
g	grams
g/t	Grams per tonne
GA	General Arrangement
GDP	Gross Domestic Product
GMD	Gearless Mill Drives
Golder	Golder Associates Ltd.
GPS	Global positioning system
GUC	Geo-Unit Composite
Gyp	Gypsum
ha	Hectare
Hg	Mercury
HDH	Horizontal drill holes
HPGRs	High Pressure Grinding Rolls
HQ	88.9 mm diameter drill bit and rods
HSRC	Health Safety and Reclamation Code for Mines in British Columbia
ID4	Inverse Distance Weighting to Power of 4
IDW	Inverse Distance Weighing
IMH	Iron Mask Hybrid unit
IP	Induced Polarization
IRR	internal rate of return
KAM	KGHM Ajax Mining Inc.
KGHM S.A.	KGHM Polska Miedź S.A.
KGHMI	KGHM International Ltd.
km	kilometers
Koz	Thousand ounces
kV	Kilovolt

Abbreviation	Meaning
LAT	Latite
lb	pound
LG	Lerchs-Grossmann
LG stockpile	Low grade stockpile
LIMS	Laboratory Information Management Systems
LMP	Lamprophyre
LOM	Life of mine
LSA	Local Study Area
LSLD	Late Sugarloaf Diorite
m	metres
m/s	Metres per second
M3	M3 Engineering & Technology Corporation
m^3	Cubic meters
Ma	(mega-annum)
MAFV	Mafic volcanics
masl	Meters above sea level
MDA	Mine Development Associates
MEM	Ministry of Energy and Mines
MINDIS	Minimum Distance of a sample to the centre of the ellipsoid
MG stockpile	Mid grad stockpile
mL	Milliliter
Mlb	Million pounds
mm	Millimeter
Mm^3	Million cubic meters
MMPO	Mines Major Mine Permitting Office
MNBC	Métis Nation BC
Mo	Molybdenum
MRC	Mine Review Committee
MRE	Mineral Resource Estimate
MRSFs	mine rock storage facilities
Mt	Million tonnes
MYAB	Multi Year Annual Based
NAG	Non-potentially acid generating
New Gold	New Gold Inc.
NI 43-101	National Instrument 43-101
NoC	Notice of Commencement
Norwest	Norwest Corporation
NOW	Notice of Work
NPI	Net Profit Interest
NPR	Neutralizing potential to acid generating potential ratio
NPV	Net Present Value
NQ	69.9 mm diameter drill bit and rods
NSR	Net Smelter Return
NTS	National Topography System
NVP	Nicola Volcanics Picrite
NVV	Nicola Volcanics & Volcaniclastics

Abbreviation	Meaning
ODEX	Down-hole air hammer system that is designed to advance casing during drilling
OB	overburden
OHS	WorkSafe BC Occupational Health and Safety Regulation
oz	Ounce
PAG	Potentially acid generating
PEA	Preliminary Economic Assessment
PHD	Pothook Diorite
PICR	Picrute
PMF	Probable maximum flood
POC	Parameters of concern
ppb	Parts per billion
ppm	Parts per million
PQ	114.3 mm diameter drill bit and rods
PXPP	Pyroxene Plagioclase Porphyry
PP	Pre-production
QA/QC	Quality Assurance and Quality Control
QP	Qualified Person
ROM	Run-of-mine
RPD	Relative percent difference
RQD	rock quality designation
SLD	Sugarloaf Diorite
SMRSF	south mine rock storage facility
SR	Strip ratio
SRL	Sugarloaf Ranches Ltd.
SSN	Stk'emlupsemc te Secwepemc Nation
SVHYB	Sugarloaf Volcanic Hybrid units
SVOL	Search Volume
t	tonne
t/d	Tonnes per day
TNRD	Thompson Nicola Regional District
TSF	Tailing Storage Facility
U-Pb	Uranium – Lead dating
USD/US$	US dollars
UTM	Universal Transverse Mercator
V	Volt
WMP	Water Management Plan
WMRSF	West Mine Rock Storage Facility
wmt	Wet metric tonne

2.4 Source of Information & Data

Key sources of information are listed in Section 27 of this report.

3 Reliance on Other Experts

M3 Engineering & Technology Corporation (M3) followed standard professional practices in the preparation of this report. Data used in this report have been verified where possible and M3 has no reason to believe that the data were not collected in a professional manner.

Technical data provided by KAM for use by M3 in this engineering phase of the project is the result of work conducted, supervised, and/or verified by KAM's professional staff and/or their consultants.

A full list of references is included in Section 27.

M3 has not independently verified the legal status or title of the claims or exploration permits, and has not investigated the legality of any of the underlying agreement(s) that may exist concerning the property.

This report has been prepared with the input of other consultants and experts, who are listed below:

- Richard Dawson, P.Eng., of Norwest, for matters relating to tailings storage facility designs, as discussed in Section 18.3.
- Jeremy Clowes, P. Eng., of Urban Systems, for matters relating to fresh water supply system design, as discussed in Section 18.5.

The Qualified Person relied on information provided by KAM for these sections. The Qualified Person reviewed this information and believes the results to be reasonable.

4 Property Description and Location

4.1 Property Location & Size

The Ajax property is located in the South-Central Interior of British Columbia, southeast of the junction of the Trans-Canada Highway (No. 1) and the Coquihalla Highway (No. 5), within the Thompson Nicola Regional District. The coordinates for the center of the Ajax Project area are approximately 50°36’ north latitude and 120°24' west longitude. The Ajax property is situated south of downtown Kamloops, BC (Figure 4-1) and is located on mineral titles reference maps 092I068, 092I069, 092I058, 092I059 (National Topography System (NTS) 92I/09) in the Kamloops Mining Division.

The primary components of the mine will include open pit, mine rock storage facilities, a processing facility and truck shop, a fresh water intake and pipeline, and a tailings storage facility. These primary components will be located outside of the Kamloops city limits, largely on private land owned by KAM, with some utilization of Crown land. Some ancillary facilities, including the exploration camp, administration building, and explosives storage, may be located just within the city boundaries. Access to the mine site will be via an upgraded Inks Lake Interchange off Highway 5 (Coquihalla Highway) and then along the Mine Access Road (the historic haul road from the old Afton Mine).The east mine rock storage facility, which is the closest proposed mine infrastructure to developed areas, is approximately 1.5 km away from the nearest housing developments in the city of Kamloops.

4.2 Mineral Tenure

KAM has the mineral rights in respect of approximately 11,192.17 ha of land (Figure 4-2 and Table 4-1) in the Ajax area. In particular, KAM has ownership of 67 regular mineral claims and 32 Crown-granted mineral claims. Of these, 59 of the regular mineral claims and 28 of the Crown grants are contiguous and form the Ajax project area. All but one of the remaining claims and Crown grants form a second contiguous block slightly to the southeast of the Ajax area.

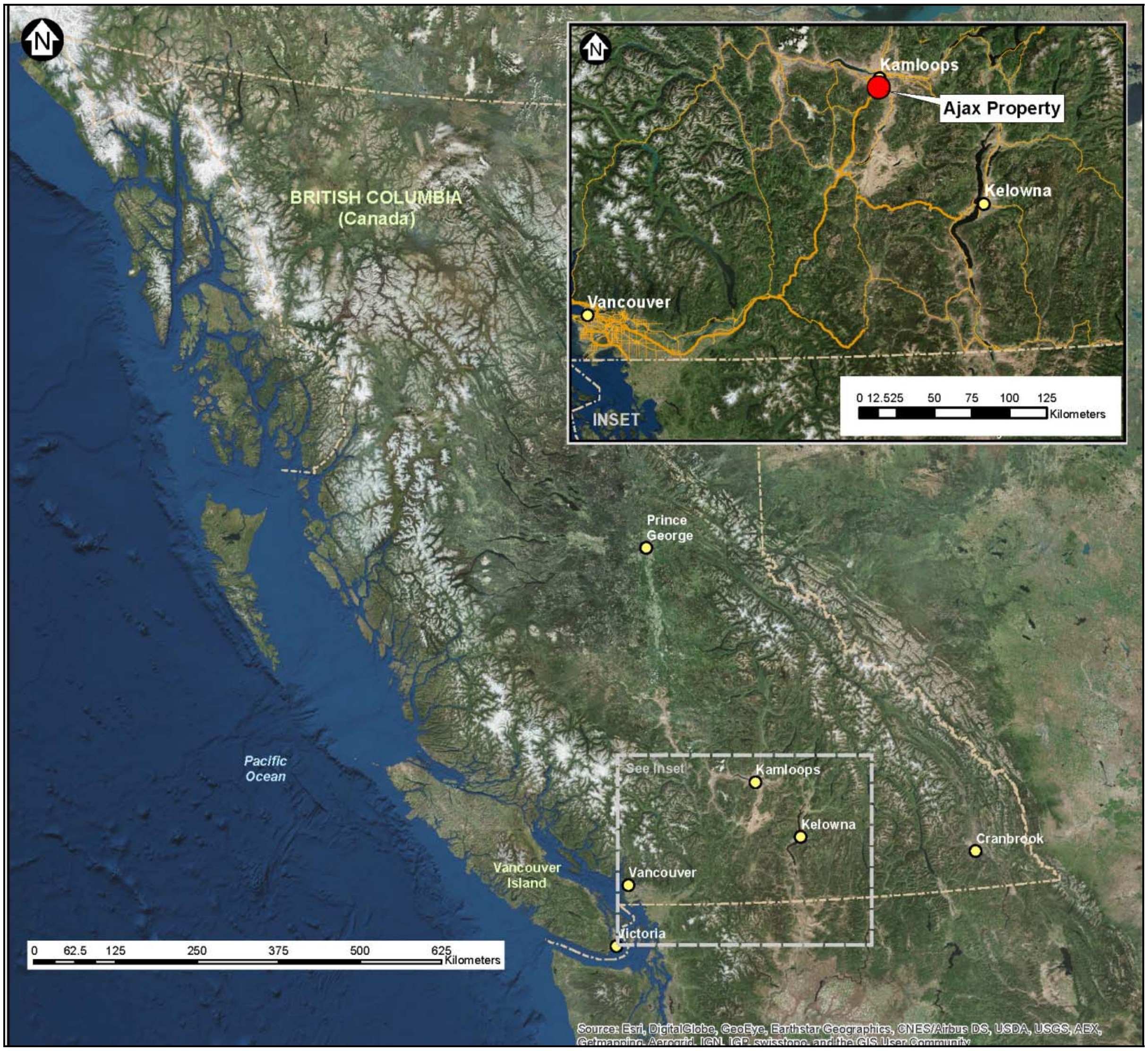


Figure 4-1: Ajax Property Location Map

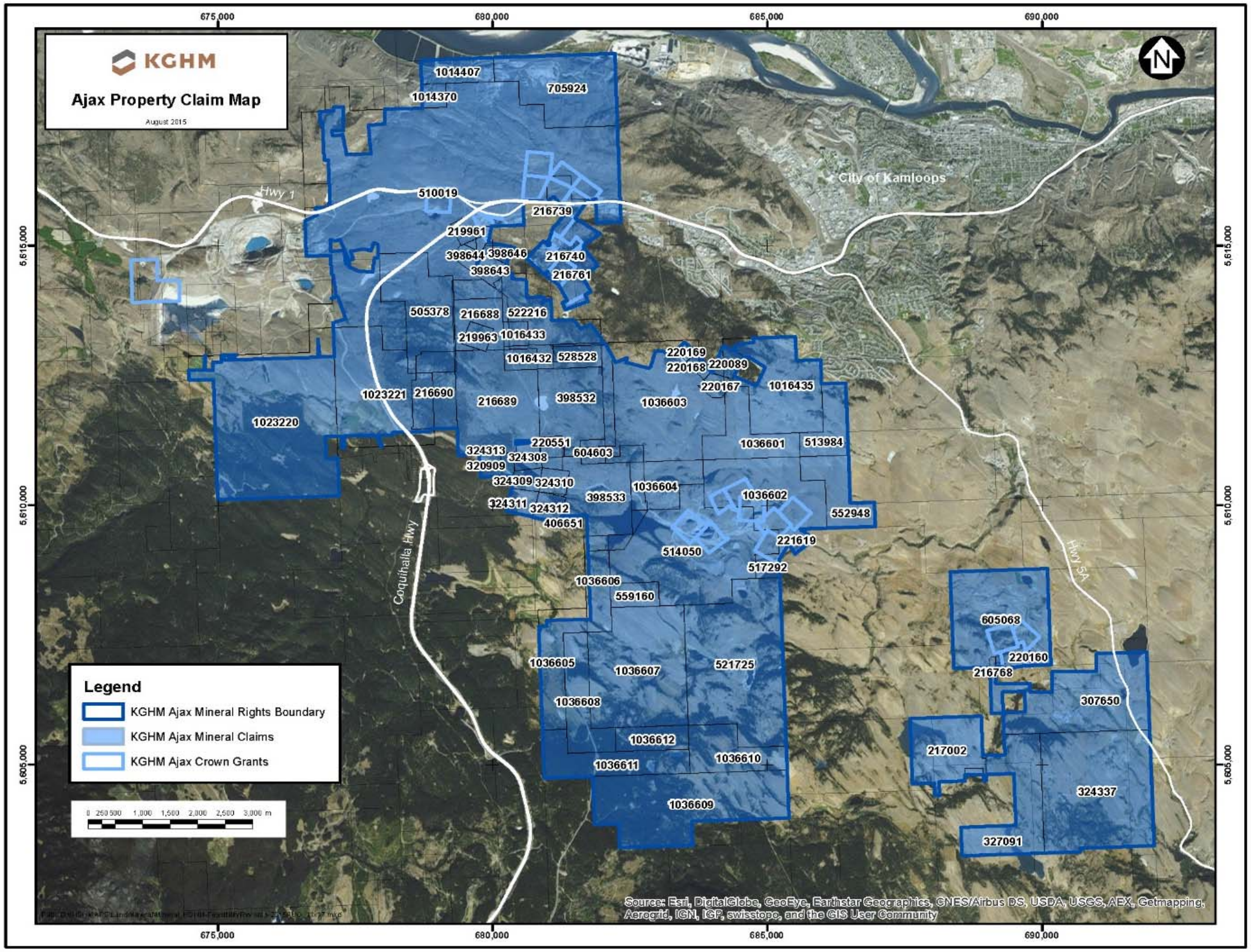


Figure 4-2: Ajax Property Claim Map

Table 4-1: Ajax Area Claims

Tenure Number	Tenure Type	Claim Name	Owner	Good To Date	Area (ha)
Contiguous KAM Ajax Claims					
216688	Mineral	RAINBOW NE	KAM	2018/Oct/31	150
216689	Mineral	RAINBOW SE	KAM	2018/Oct/31	300
216690	Mineral	RAINBOW SW	KAM	2018/Oct/31	150
216740	Mineral	OR #14	KAM	2018/Oct/31	25
216745	Mineral	REFER TO LOT TABLE	KAM	2018/Oct/31	25
216761	Mineral	DELTA 1061	KAM	2018/Oct/31	25
219961	Mineral		KAM	2016/Mar/02	20.05
219963	Mineral		KAM	2016/Aug/10	20.89
220089	Mineral	PYTHON NO.15	KAM	2015/Sep/26	25
220167	Mineral	DOT NO.2	KAM	2015/Sep/26	25
220168	Mineral	DOT NO.3	KAM	2015/Sep/26	25
220169	Mineral	DOT NO.5	KAM	2015/Sep/26	25
220551	Mineral	X #16	KAM	2018/Oct/31	25
221619	Mineral	PLANE 19 FR.	KAM	2018/Jun/01	25
320909	Mineral	JAXD 8	KAM	2018/Oct/31	25
324308	Mineral	INK 1	KAM	2018/Oct/31	25
324309	Mineral	INK 2	KAM	2018/Oct/31	25
324310	Mineral	INK 3	KAM	2018/Oct/31	25
324311	Mineral	INK 4	KAM	2018/Oct/31	25
324312	Mineral	INK 5	KAM	2018/Oct/31	25
324313	Mineral	INK 6	KAM	2018/Oct/31	25
398532	Mineral	DCE 1	KAM	2018/Oct/31	300
398533	Mineral	DCE 2	KAM	2018/Oct/31	300
398643	Mineral	WIRE 1	KAM	2018/Oct/31	25
398644	Mineral	WIRE 2	KAM	2018/Oct/31	25
398645	Mineral	WIRE 3	KAM	2018/Oct/31	25
398646	Mineral	WIRE 4	KAM	2018/Oct/31	25
406651	Mineral	GM 70	KAM	2015/Nov/22	200
505378	Mineral		KAM	2018/Oct/31	225.395
510019	Mineral		KAM	2018/Oct/31	1659.012
513984	Mineral	AJ 9	KAM	2018/Jun/01	82.001
514050	Mineral		KAM	2018/Jun/01	451.2
517292	Mineral	Ajax	KAM	2018/Jun/01	20.511
521725	Mineral	Ajax	KAM	2018/Jun/01	492.422
522216	Mineral	DAVES DREAM	KAM	2018/Oct/31	122.947
528528	Mineral	522216 EXTRA	KAM	2018/Oct/31	40.988
552948	Mineral	AJ	KAM	2018/Jun/01	102.5259
559160	Mineral	NEW GOLD OPTION	KAM	2018/Jun/01	41.0241
604603	Mineral	AJ P EAST	KAM	2015/Sep/26	20.5013
705924	Mineral	OR11	KAM	2018/Oct/31	245.6925
1014370	Mineral	EB12	KAM	2015/Nov/08	20.4746
1014407	Mineral	EB13	KAM	2015/Nov/09	61.4187
1016432	Mineral	Bill1	KAM	2018/Oct/31	40.9884
1016433	Mineral	Bill2	KAM	2018/Oct/31	20.4924
1016435	Mineral	Dianna1	KAM	2018/Jun/01	266.4627
1023220	Mineral	Bill1	KAM	2018/Oct/31	655.944
1023221	Mineral	Bill2	KAM	2018/Oct/31	348.44
1036601	Mineral	Clyde1	KAM	2018/Jun/01	123.0045
1036602	Mineral	Clyde2	KAM	2018/Jun/01	246.0605
1036603	Mineral	SRLNorth	KAM	2018/Jun/01	471.4538
1036604	Mineral	SRLSouth	KAM	2018/Jun/01	102.5202
1036605	Mineral	Ajax1S	KAM	2018/Jun/01	123.0998
1036606	Mineral	Ajax1N	KAM	2018/Jun/01	82.0441
1036607	Mineral	Ajax2E	KAM	2018/Jun/01	389.8338

Tenure Number	Tenure Type	Claim Name	Owner	Good To Date	Area (ha)
1036608	Mineral	Ajax2W	KAM	2018/Jun/01	123.1174
1036609	Mineral	Ajax3S	KAM	2018/Jun/01	390.0242
1036610	Mineral	Ajax3N	KAM	2018/Jun/01	123.1441
1036611	Mineral	Ajax4S	KAM	2018/Jun/01	143.6688
1036612	Mineral	Ajax4N	KAM	2018/Jun/01	61.5681
Total					**9238.9199**
Contiguous KAM Crown Grants					
4710	Crown Grant	Ajax	KAM	-	20.9
4712	Crown Grant	NEPTUNE	KAM	-	18
1496	Crown Grant	GRASS ROOTS	KAM	-	20.9
4716	Crown Grant	MONTE CARLO	KAM	-	18.3
4717	Crown Grant	SULTAN	KAM	-	18.9
2126	Crown Grant	WHEAL TAMAR	KAM	-	20.9
3015	Crown Grant	COPPER STAR FRACT.	KAM	-	10.6
3016	Crown Grant	FORLORN	KAM	-	16.7
878	Crown Grant	IRON MASK	KAM	-	15.5
879	Crown Grant	SUNRISE	KAM	-	19.8
880	Crown Grant	COPPER QUEEN	KAM	-	20.6
1036	Crown Grant	LUCKY STRIKE	KAM	-	5.8
1050	Crown Grant	EMEROY	KAM	-	17.5
1066	Crown Grant	ERIN	-	-	14
1067	Crown Grant	JUMBO	KAM	-	1.7
1068	Crown Grant	CIVIL EARNSCLIFFE	KAM	-	0.7
1301	Crown Grant	FRACTION	KAM	-	0.7
1311	Crown Grant	MAY FRAC.	KAM	-	10.5
4666	Crown Grant	SODIUM FRACTION	KAM	-	2.3
4667	Crown Grant	WINTY	KAM	-	20
5622	Crown Grant	CHAMPION NO.1	KAM	-	9.6
5623	Crown Grant	CHAMPION NO.2	KAM	-	19.1
5624	Crown Grant	L.S. NO.6	KAM	-	15.6
5625	Crown Grant	L.S. NO.7	KAM	-	17.4
5626	Crown Grant	L.S. NO.11	KAM	-	16.7
5627	Crown Grant	L.S. NO.10	KAM	-	20.9
5628	Crown Grant	L.S. NO.8	KAM	-	12.2
5629	Crown Grant	L.S. NO.9	KAM	-	14.9
Total					**400.7**
KAM Claims Non-contiguous with Ajax					
216739	Mineral	OR #13	KAM	2016/Sep/26	25
220160	Mineral	ACE NO. 1	KAM	2016/Sep/26	25
216768	Mineral	WILDROSE 2	KAM	2016/Oct/31	25
217002	Mineral	SUNNY	KAM	2016/Oct/31	225
307650	Mineral	JOKER	KAM	2016/Oct/31	450
324337	Mineral	ACE	KAM	2016/Oct/31	500
327091	Mineral	ACE 2	KAM	2016/Oct/31	375
605068	Mineral	GRADEN	KAM	2016/Oct/31	328.2491
Total					**1,953.2491**
KAM Crown Grants Non-contiguous with Ajax					
1560	Crown Grant	BLACK BEAUTY	KAM	-	17.8
1561	Crown Grant	ADMIRAL DEWDNEY	KAM	-	20.7
1562	Crown Grant	CYCLONE	KAM	-	14.3
551	Crown Grant	-	KAM	-	**48.6**
Total					**101.4**

4.3 Royalties & Agreements

4.3.1 Formation of a Joint Venture Company

On June 29, 2010, pursuant to an investment agreement dated May 4, 2010 between Abacus and KGHM, Abacus transferred its mineral property interests in the Ajax project to KAM in exchange for common shares. On October 12, 2010 KAM, KGHM and Abacus entered into a Joint Venture Shareholders Agreement. Pursuant to the Joint Venture Shareholders Agreement, KGHM subscribed for common shares of KAM which at the time represented a 51% shareholding in Ajax.

On October 12, 2010, KGHM received a title opinion from Davis LLP confirming it had good safeholding and marketable title to certain undersurface rights comprising the Ajax project, subject only to certain pre-existing registered encumbrances, unregistered agreements and statutory exceptions. On October 12, 2010, KGHM also received a title report from Davis LLP in respect of certain recorded mineral claims comprising part of the Ajax project, confirming the good standing of those claims and setting forth the existing royalties and agreements applicable thereto.

On April 2, 2012 KGHM exercised its option to acquire an additional 29% of KAM from Abacus, thereby increasing its ownership to 80%, with Abacus retaining the other 20% interest. On April 26, 2012 KGHM assigned its 80% ownership of KAM to a wholly owned subsidiary, 0929260 B.C. Unlimited Liability Company. On August 17, 2012, KGHM notified Abacus that it was exercising its option and appointed KGHM International Ltd. (KGHMI) as the operator of the Ajax project, effective September 1, 2012.

The Joint Venture Shareholders Agreement sets out the parameters for the development of the Ajax project and the surrounding area, from feasibility study through to production.

4.3.2 Asset Purchase Agreement with Teck and Acquisition from New Gold

On November 25, 2005 Abacus had signed an asset purchase agreement with Teck and Afton Operating Corporation (“**Afton**”) for the purchase of land, buildings, equipment, tailings pond and certain back-in rights pursuant to the Rainbow and Iron Mask property agreements. On June 4, 2009, May 18, 2010 and July 31, 2010 the parties amended the asset purchase agreement. The rights under this agreement and the amendments were transferred into KAM in accordance with the May 4, 2010 investment agreement. Pursuant to the aforesaid asset purchase agreement, Teck retained a 1.5% NSR royalty with respect to each of the Rainbow and Iron Mask properties that were purchased by Abacus from Teck and which comprise part of the Ajax project. These royalties can be purchased by KAM for $3 million each within two years from the date of commencement of commercial production on the respective properties.

In connection with the asset purchase agreement and the acquisition by New Gold Inc. (“**New Gold**”) of certain other assets from Teck in the area of the former Afton Mine, Abacus, Teck, Afton, Sugarloaf Ranches Limited, a wholly-owned subsidiary of Teck, and New Gold entered into an agreement dated March 19, 2008, which sets forth certain agreements among the parties relating to the shared use of certain assets of the former Afton Mine site, including the use of and access to roads, rights of ways, and use of the former Afton Mine water system.

Also on March 19, 2008, Abacus entered into an option agreement with New Gold to acquire up to a 100% interest in additional mineral claims within the area of the Ajax pit. Abacus earned its interest in these claims in November 2009 and New Gold elected to retain a 10% Net Profit

Interest (NPI) royalty. The rights under this option agreement were also transferred into KAM in accordance with the May 4, 2010 investment agreement.

4.3.3 2011 Asset Exchange Agreement with New Gold

On September 22, 2011 KAM completed an asset exchange agreement with New Gold whereby New Gold acquired from KAM the former Afton Mine buildings and the lot on which they are located. The buildings were not being used by KAM and are not required for future operations. In exchange, KAM acquired from New Gold and cancelled the aforementioned NPI royalty which New Gold held on certain claims within the area of the Ajax pit. KAM also obtained certain mining claims located north of the Ajax pit. One claim, located outside the proposed pit area, is subject to a royalty agreement (1.5% NSR with a subject to buy down clause).

4.3.4 Purchase of Sugarloaf Ranches Limited

On July 3, 2009 Abacus entered into option agreements with Teck, Afton and Sugarloaf Ranches Ltd ("**SRL**") to acquire approximately 6,000 acres (approximately 2430 hectares) of land around the Ajax deposit. These options were transferred by Abacus to KAM on October 12, 2010 but were never exercised, as they were superseded by a Purchase Agreement dated December 13, 2011 between Teck, Afton and KAM. On July 31, 2012 KAM completed the acquisition of 100% of the shares of SRL and certain fee simple lands of Afton and Teck The acquisition is adjacent to the Ajax project and will allow for the use of a portion of the property for the Ajax project facilities.

4.3.5 2014 Asset Exchange Agreement with New Gold

On May 23, 2014 KAM and its wholly owned subsidiary, SRL, entered into an asset exchange agreement with New Gold. KAM and SRL transferred ownership of certain mineral claims and a water system to New Gold in exchange for certain other mineral claims owned by New Gold. In addition KAM and SRL granted options for the purchase of certain KAM lands, certain SRL lands and certain mineral claims. The options were made exercisable on or before December 11, 2019. KAM received notice on November 25, 2015 of New Gold's exercise of its option to purchase KAM certain lands comprising the historic Afton TSF. This notification has initiated negotiations to transfer tenure and authorizations.

KAM and New Gold also granted reciprocal 1.5% net smelter royalties to each other over the mineral claims exchanged, with the right to buy back up to one half of the NSR for $1,500,000.

4.3.6 Other Land & Tenure Related Negotiations

KAM has acquired other lands in close proximity to the Ajax project. These lands may be used for portions of the mine infrastructure.

Negotiations have occurred intermittently with a company holding mineral rights under the footprint of proposed Ajax mine rock storage area. KAM has also been successful in acquiring the mineral rights under the footprint of most of the tailings storage facility.

Negotiations are currently ongoing with two other landowners with lands in close proximity to the Ajax project.

4.4 Environmental Liabilities

The Ajax deposit was previously mined as a satellite open pit in the late 1990s by Afton, and the ore was transported to the main mill located at the current New Afton mine. To support this operation, a mine haul road and mine road overpass over Lac La Jeune road were constructed and still exist today. As a result of the direct mining activities on the Ajax site, open pits, mine rock storage facilities, and seepage collection ponds associated with the site remain and have been reclaimed. These facilities are managed by KAM under MEM permit M-112. Tailings were generated and stored at the historic Afton processing mill. The historic tailings storage facility is not located on the proposed Ajax project footprint but within the footprint of the lands exercised for purchase by New Gold as described in section 4.3.5.

Of the three open pits, two have been partially backfilled with mine rock and reclaimed, while the third contains approximately 500,000 m^3 of water. The mine rock storage facilities have been covered with topsoil and revegetated. Overall, the site is in stable condition and is used primarily as ranching graze land for cattle. A berm has been constructed around the open pit lake to limit access by wildlife and cattle, as the water quality exceeds livestock guidelines for certain parameters. This water will not be released to the environment unless treated to sufficient standards. Peterson Creek, a tributary fed by the Jacko Lake Dam spillway and low level outlet operated by an appointed bailiff to fulfill water licenses, was re-established by Afton as it was diverted during mining operations historically.

Investigations under notice of work permits are ongoing and include drill sites, test pits, and monitoring wells. Sites are actively reclaimed as soon as practical. A road network utilized by both ranchers and KAM staff are left open for ease of access, where as temporary trails to drill sites are reclaimed as soon as practical. A water monitoring network consisting of 38 wells and several flow meters exists to measure current and future water levels and water quality on the Ajax project site. An air monitoring station has also been installed upwind of the project and will continue to capture data through the project life and into closure.

4.5 Permits & Authorizations

As outlined in Section 6, exploration began in the Kamloops area in the 1880s with copper, gold, and iron mineralization discovered at the Iron Mask Mine and in the project area, underground exploration began in 1898. Exploration and limited development work was completed over the subsequent decades with commercial production by Afton Mines at Ajax East and Ajax West in 1989. Production was suspended in 1991 due to low metal prices with a second period of production beginning in 1994 and suspended in 1997. During the periods of production, an estimated 17 Mt were mined and 13Mt were milled.

The tailings storage facility (TSF) and project components were decommissioned by Afton in accordance with their closure plan, which includes maintenance requirements for dams, hydraulic structures and appurtenances to ensure that they are safe and stable. The historic Afton mine site, including the mill building and deactivated and decommissioned TSF, is situated 10 km west of the project and authorized by permits/authorizations held by KAM including:

- *Mines Act* permit M-112 - Reclamation Permit - The M-112 Permit was issued to The Afton Operating Corporation following mine closure in 1999. KAM assumed all reclamation liabilities for some components of the historic Afton Operation including the Tailings Storage Facility, Ajax East and Ajax West pits, Mine Rock Storage Facilities, and associated seepage collection structures with site activities focused on general care and maintenance of historic facilities, reclamation research and development, and noxious weed control.

- PE-3904 *Environmental Management Act* permit - issued originally in 1976 encompassed all operations including the east and west pits, pothook pit and crescent pit and associated water bodies, seepage ponds and diversion channels. The permit has been amended several times with the most recent amendment issued in 2011 with current requirements including a water sampling program at locations within the Peterson Creek and Cherry Creek watersheds.

- Multi Year Annual Based (MYAB) *Mines Act* permit – authorizes exploration activities outlined in Notice of Work (NOW) and Reclamation applications.

The scope and terms of these existing authorizations may need to be amended and/or new authorizations may be needed, to reflect the transfer of surface and subsurface rights in the vicinity of the former Afton TSF to New Gold pending completion of negotiations between KAM and New Gold.

The proposed Ajax project is required to obtain an Environmental Assessment Certificate from the provincial government prior to receipt of provincial permits. Likewise, a positive federal Ministerial decision on the Environmental Impact Statement is required to obtain federal authorizations. In addition to the environmental assessment process, the project will require multiple permits and approvals for construction, operation and closure. Table 4-2 and Table 4-3 provide a preliminary list of provincial and federal permits and authorizations required to construct and /or operate the project, to the extent known to date. Where possible, amendment to existing permits/authorizations is included (and identified in the table), however, in most cases new permits and authorizations are needed.

Table 4-2: Provincial Permits & Authorizations Required

Statute	Authorization or Permit
Mines Act	*Mines Act* Permit
Mines Act and Code (part 8)	Explosives Magazine Storage and Use permit
Mineral Tenure Act	Mining Lease
Environmental Management Act	Operations Permit Waste Discharge – Effluent
Environmental Management Act	Operations Permit Waste Discharge – Air Emissions
Environmental Management Act	Amendment of current permit PE 39-04 Waste Discharge Permit – Effluent
Environmental Management Act	Amendment of current permit PE 39-04 Waste Discharge Permit – Air
Environmental Management Act	Independent Remediation Notification
Environmental Management Act - Hazardous Waste Regulation	Hazardous Waste Registration
Environmental Management Act	Waste Discharge Permit – Solid Waste
Environmental Management Act	Fuel Storage Registration
Environmental Management Act - Municipal Sewage Regulation	Sewage Registration
Heritage Conservation Act	Site Alteration Permits
Forest Act	Occupant License to Cut
FPC Act – Provincial Forest Use Regulation	Special Use Permit
Land Act	License of Occupation – Statutory Right of Way
Land Act	License of Occupation
Land Act	Grazing Lease Amendment

Statute	Authorization or Permit
Water Act, Water Regulation	Water Regulation Notification
Water Act, Water Regulation	Notification of "changes in or about a stream" (S.8/S.9)
Water Act, Water Regulation	Water Licenses
Agricultural Land Commission Act	Temporary change to non-agricultural use
Agricultural Land Commission Act	Transportation and Utility Use in the ALR
Agricultural Land Commission Act	Permanent removal from the ALR
Transportation Act	Access and Works on MOTI ROW
Transportation Act	Access/Controlled Area Approval
Transportation Act	Road Closure
Drinking Water Protection Act	Construction Permit
Drinking Water Protection Act	Operating Permit
Public Health Act- Sewerage System Regulation 326/2004	Holding Tank Permit
Motor Vehicle Act	Approvals for oversize loads or bulk haul
Weed Control Act	Noxious Weed Control Permit
Wildlife Act	Wildlife Handling Permit
Wildlife Act and Angling and Scientific Collection Regulation, BC Reg., 125/90	Fish Salvage Permit
Public Health Act – Sewerage System Regulation 326/2004	Filing of Certification Letter

Table 4-3: Federal Permits & Authorizations Required

Statute	Authorization or Permit
Explosives Act	Explosives Manufacturing Licence and Certificate for the blending of ANFO
Explosives Act	Explosives Transportation Licence
Explosives Act	Explosives Magazine Licence
Radio Communications Act	Radio Licences
Atomic Energy Control Act	Radioisotope Licence
Fisheries Act	Authorization for serious harm to fish habitat

4.6 Taxes & Assessment Work Requirements

Assessment requirements for mineral claims are variable, and regulated by the *Mineral Tenure Act*. Fees are based on area of tenure, and the fee rate is determined by the anniversary date of the claim and whether or not exploration and development work occurred on the claim.

Yearly tax payment requirements on the Crown grants owned by KAM are issued under the *Mineral Land Tax Act*. A flat per-hectare fee is used to determine total tax costs.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Property Access

The Ajax mine will be accessed via a new mine access road that is planned to be constructed over the historic haul road (approximately 3.4 km long). The mine access road will connect the mine site to an upgraded Inks Lake interchange on the Coquihalla Highway. The mine access road will continue over Lac Le Jeune Road, with a new overpass planned to be constructed at this intersection. A short connector road will allow access to Lac Le Jeune road to the mine access road. The connection to Lac Le Jeune Road is approximately 9 km southwards from the intersection of Lac Le Jeune Road and Copperhead Drive off of Highway 1, west of Kamloops.

5.2 Local Resources & Infrastructure

Local resources necessary for the exploration, development, and operation of the Ajax property are located in Kamloops. Kamloops has a resource-based economy and is a transportation hub for the Canadian National Railway (CNR) and Canadian Pacific Railway (CPR). Both Highway 1 and Highway 5 service Kamloops and the project intends to utilize access from Highway 5 during construction and operations. There is also an airport with daily scheduled flights to Vancouver, Calgary, Kelowna and Prince George.

Numerous service and supply companies which service resource industries are established in Kamloops, including several diamond drilling companies, light-to-heavy equipment contractors and a metallurgical testing laboratory.

Fresh water will be pumped from Kamloops Lake to the plant site. Kamloops Lake is fed by the Thompson River.

Power to the site will be supplied by BC Hydro grid power with an interconnection point approximately 12 km from the project site.

The proximity to the City of Kamloops will eliminate the need for a construction camp to house the workers required to construct the project.

5.3 Topography & Vegetation

The Ajax area consists of rolling grasslands with timber at higher elevations. Elevations range from 800 to 1,100 masl. Sugarloaf Hill is the prominent landform in the area and has an elevation of 1,130 m. The area has been glaciated and numerous drumlins are present.

At lower elevations, the vegetation is typically bunchgrass, sagebrush, and prickly pear cacti. Higher elevations commonly sustain growths of Lodgepole Pine, Douglas Fir, and Ponderosa Pine.

5.4 Climate

The climate of the Ajax Project area is typical of the dry British Columbia Interior Region, with generally low total precipitation and high evaporation. It can be classified as a semi-arid climate (Köppen Climate Classification System) due to its rain shadow location.

As per 2014 Climatology Report by Knight Piésold, the following are key climatic parameters applicable for the project area:

- The long-term average annual temperature is estimated to be 6.4ºC, with average monthly temperatures ranging from 18.7°C in July to -4.9°C in December.
- Relative humidity varies throughout the year, but is typically highest in mid-winter and lowest in mid-summer, with respective estimated long-term monthly average values of approximately 88.5% in January and 48.6% in July.
- The average wind speed for the period of record is 2.3 m/s at the AjaxMET station and the wind blows predominantly northwesterly in the summer and south-southeasterly in the winter.
- The long-term mean annual precipitation is estimated to be 336 mm.
- Precipitation is reasonably evenly distributed throughout the year, although June and July are typically the wettest months due to convective storm activity.
- Approximately 30% of precipitation is expected to fall as snow, corresponding to the mean annual snowfall (snow water equivalent) of 101 mm.
- Approximately 70% of precipitation is expected to fall as rain, corresponding to the mean annual rainfall of 235 mm.
- The mean annual lake evaporation is estimated to be 579 mm.
- The 1 in 10 year maximum 24-hour precipitation is estimated to be 43.2 mm.
- The probable maximum 24-hour precipitation is estimated to be 219.1 mm.
- Sublimation was estimated to be 28 mm for the winter season.

Exploration activities can operate year-round with appropriate equipment.

5.5 Surface Rights

The Ajax Project is primarily situated in the Thompson Nicola Regional District (TNRD) with a portion of lands that fall within the City of Kamloops. The project site is also located near Knutsford, a rural community located just outside the City of Kamloops boundary.

KAM and its wholly owned subsidiary, Sugarloaf Ranches Ltd., own or are in the process of acquiring, the private surface rights available in the footprint of the proposed project. The balance of surface rights within the project footprint, are held by the province of British Columbia.

Surface land acquisition began in 2011 with the purchase of Sugarloaf Ranches by KAM. Additional properties were acquired from 2011 to present day, with additional acquisitions expected to be completed by the end of 2015. All surface lands fall within the City of Kamloops or the Thompson Nicola Regional District jurisdictions. It should be noted that a majority of the properties fall within the Agriculture Land Reserve.

Within the City of Kamloops, KAM and Sugarloaf Ranches Ltd. currently own 28 lots (Figure 5-1). Within the TNRD, KAM and Sugarloaf Ranches Ltd. currently own 129 lots. Total area of land owned is approximately 4500 hectares.

In addition to surface rights, KAM has acquired right of ways for the proposed high voltage power line access, from the east of the project. Right of ways for additional utility corridors for power and water lines associated with the fresh water system, and natural gas system are under discussion at this time.

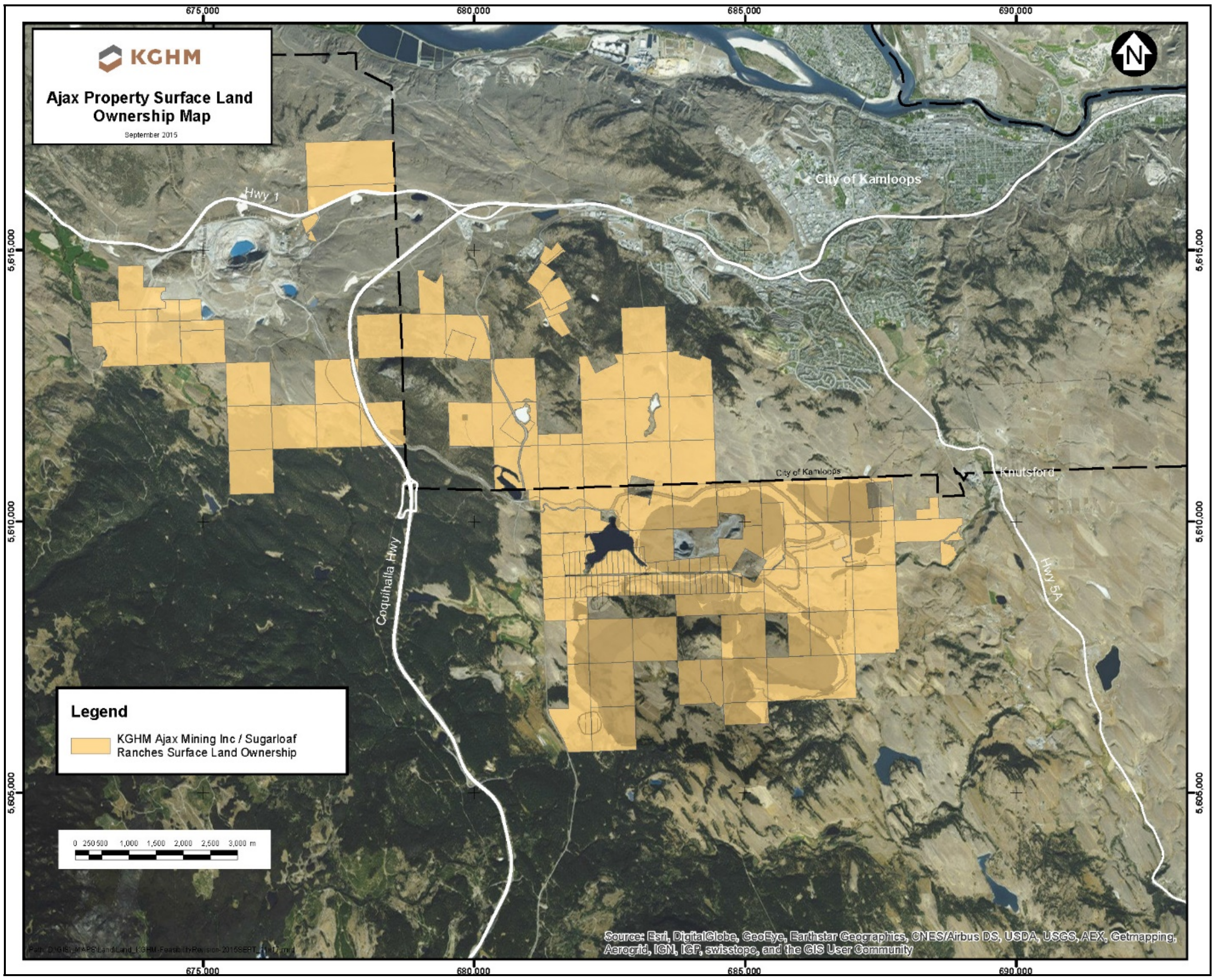


Figure 5-1: Surface Land Ownership

6 History

6.1 History of Ownership & Exploration

Exploration began in the area in the 1880s. Copper, gold, and iron mineralization was discovered at the Iron Mask Mine near Kamloops in 1896. Nearby properties were explored by underground methods in the following years, including the Wheal Tamar, Ajax, and Monte Carlo claims in the Ajax area (Figure 4-2, Table 4-1).

In the Ajax area, underground exploration began on the Wheal Tamar claim in 1898. Development work was completed on the Monte Carlo claim as early as 1905 and on the Ajax claim in 1906. The Monte Carlo claim included an 18 m shaft. Exploration is reported to have continued over the Wheal Tamar, Ajax, and Monte Carlo areas, but became sporadic after 1914.

In 1916, Granby Consolidated Mining, Smelting, and Power Company Ltd. (Granby) completed diamond drilling on the Wheal Tamar group.

In 1928, the Consolidated Mining and Smelting Company of Canada Ltd. (CM&S) obtained options on claims in the Ajax area and completed surface drilling on the Ajax claims (10 DDH) and the Monte Carlo (3 DDH) claims. Sparse mineralization was reported.

In 1952, the property was optioned to Berens River Mines Ltd. (Berens). Berens completed four DDH between the Monte Carlo and Wheal Tamar claims, but no mineralization was reported.

In 1954, CM&S and its successor, Cominco, entered into option agreements and explored the area until 1980. Exploration included electromagnetic (1954) and magnetometer (1967) geophysical surveys. Cominco completed 56 DDH, totaling more than 7,500 m, in 1967 on the Ajax, Wheal Tamar, and Monte Carlo claims.

In 1973, Afton Mines Ltd. (Afton Mines) completed an induced polarization survey and drilled 55 percussion drill holes totaling approximately 4,700 m on the Ajax, Wheal Tamar, and Monte Carlo claims.

In 1980, Cominco completed magnetometer and induced polarization geophysical surveys, and drilled 190 percussion holes (14,347 m) in the Ajax area.

In 1986, Afton Mines, controlled by Teck, obtained an option to earn 70% interest in the Ajax properties from Cominco. In 1987, Afton Mines completed 77 DDH (11,582 m). In 1988, development work began on the Ajax West and East open pits and a haul road was constructed to the Afton mill (10 km northwest of the Ajax area).

Afton Mines commenced production at Ajax East and Ajax West in 1989. Production was suspended in 1991 due to low metal prices. A second period of production began in 1994 and was again suspended in 1997. During the periods of production, an estimated 17 Mt were mined and 13 Mt were milled.

The tailings storage facility (TSF) and project components were decommissioned by Afton in accordance with their closure plan, which includes maintenance requirements for dams, hydraulic structures and appurtenances to ensure that they are safe and stable. The historic

Afton mine site, including the mill building and deactivated and decommissioned TSF, is situated 10 km west of the project.

Abacus Mining and Exploration Ltd. (Abacus) acquired the Afton property in 2002 from Teck. Abacus completed 62 km of three-dimensional (3D) induced polarization (IP) and magnetometer survey and diamond drilling on the Rainbow and Comet-Davenport areas during 2003 and 2004. In 2005, NI 43-101 compliant resource estimates were completed for the Comet-Davenport area (Darney et al, 2005a) and for the Rainbow area (Darney et al, 2005b).

Abacus explored the Ajax property with DDH from 2005 to 2011. Details of this drilling are provided in Section 10 of this report. Wardrop completed a NI 43-101 compliant resource estimate and a positive PEA for the Ajax area in 2009 (Ghaffari et al, 2009).

In June 2010, a joint venture was formed between Abacus and KGHM Polska Miedz S.A. (KGHM S.A.) creating the joint venture company KGHM Ajax Mining Inc. (KAM). KGHM S.A. purchased a 51% ownership stake in the Ajax Project.

In January 2012, the joint venture company completed a NI 43-101 compliant positive feasibility study (Ghaffari et al, 2012). The feasibility study was led by Tetra Tech.

In April 2012, KGHM S.A. exercised their option to increase their ownership stake in the Ajax Project to 80%.

In June 2012, New Gold Inc. opened the New Afton Mine, exploiting the remaining Afton orebody below the historic pit by underground methods.

In September 2012, KGHM S.A. appointed KGHM International (KGHMI), a wholly owned subsidiary of KGHM S.A., as the operator of the Ajax Project.

KAM completed significant DDH drilling at Ajax between 2012 and 2015. The details of these programs can be found in Section 10 of this report.

Between 2012 and 2015, KAM completed exploration drilling at the Rainbow, DM-Audra-Crescent and Coquihalla zones. Details of this drilling can be found in Section 9 of this report.

Between January and March of 2013, KAM completed an approximately 220 line-km 3D induced polarization survey over the Ajax Project area. Details can be found in Section 9 of this report.

In June of 2014, KAM completed an airborne magnetic geophysical survey over the Ajax property. The survey consisted of 1,146 line-km. See Section 9 of this report for details.

6.2 Historical Mineral Resources & Mineral Reserve Estimates

Historical Mineral Resource Estimates and a Mineral Reserve Estimate have been completed for the Ajax deposit, as outlined below.

6.2.1 2009 Ajax Resource Calculated by AMEC

In 2008, Abacus engaged AMEC to calculate an initial resource on the Ajax deposit; the results were released in early 2009. The results for this resource at various cut-off grades are shown in Table 6-1. Full details of the resource calculation can be found in Kuhl and Kozak (2008).

Table 6-1: 2009 Ajax Resource Calculated by AMEC

	Cut-off CuEq (%)	Tonnes (Mt)	Cu (%)	Au (g/t)	Copper (Mlb)	Gold (koz)
Measured	0.1	241.2	0.28	0.17	1,480	1,333.8
	0.2	197.6	0.31	0.19	1,365	1,232.7
	0.3	133.4	0.37	0.23	1,092	1,003.8
	0.4	81.4	0.44	0.28	784	740.1
	0.5	46.5	0.51	0.34	521	503.8
Indicated	0.1	202.2	0.28	0.18	1,240	1,136.0
	0.2	167.4	0.31	0.20	1,147	1,054.8
	0.3	112.2	0.37	0.24	915	851.7
	0.4	68	0.44	0.28	656	621.4
	0.5	39	0.51	0.34	439	421.8
Measured + Indicated	0.1	443	0.28	0.17	2,721	2,469.8
	0.2	365	0.31	0.20	2,512	2,287.5
	0.3	246	0.37	0.24	2,006	1,855.5
	0.4	149	0.44	0.28	1,441	1,361.5
	0.5	85	0.51	0.34	959	925.6
Inferred	0.1	50.4	0.21	0.14	230	225.6
	0.2	38	0.24	0.16	198	195.1
	0.3	17.7	0.30	0.20	116	112.3
	0.4	4.9	0.43	0.26	46	40.9
	0.5	2.1	0.53	0.35	25	23.4

Notes: (1) Mineral resources are not mineral reserves and do not have demonstrated economic viability. **(2)** Mineral Resources are contained within a conceptual Measured, Indicated and Inferred optimized pit shell using the following assumptions: maximum copper recovery of 92% and maximum gold recovery of 90% based on the following equations: CuRec = 43.619xCu Grade+63.002 and AuRec = 33.871xAu Grade+75.29; assumed throughput rate of 60,000 t/d; Whittle constraining shell slopes between pit slope angles of 50°, waste and processed material mining costs of US$1.50/t, fill waste mining costs of US$1.23/t, total processing costs including reclamation of US$3.76/t, general and administrative costs of US$0.90/t, gold price of US$750/oz., and copper price of US$2.50/lb. **(3)** Copper equivalency was calculated using the formula CuEq = ((%Cu) x (CuRec) x (22.0462) x ($lbCu) + (g/tAu) x (AuRec) x (1/31.1035) x ($ozAu)) / ((CuRec) x (22.0462) x ($lbCu)). **(4)** Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content. **(5)** Tonnage and grade measurements are in metric units. Contained gold and silver ounces are reported as troy ounces, contained copper pounds as Imperial pounds.

6.2.2 2009 Ajax Preliminary Economic Assessment Resource

As part of a Preliminary Economic Assessment (PEA) completed for Abacus by Tetra Tech, a resource was calculated for the Ajax deposit. Table 6-2 summarizes the 2009 PEA resource. Details of the resource can be found in Ghaffari et al (2009).

Table 6-2: 2009 Ajax Resource Summary at Various Cut-off Grades

	Cut-off CuEq (%)	Mt	Cu (%)	Au (g/t)	Mo (%)	Ag (g/t)	CuEq (%)	Cu (Mlb)	Au (koz)
Measured	0.09	253.36	0.283	0.173	0.0018	0.34	0.30	1,581.30	1,412
	0.11	244.41	0.290	0.177	0.0018	0.34	0.31	1,561.90	1,393
	0.13	231.37	0.299	0.183	0.0018	0.35	0.32	1,527.30	1,364
	0.15	216.13	0.311	0.191	0.0019	0.35	0.34	1,480.50	1,324
	0.17	198.73	0.324	0.199	0.0019	0.36	0.35	1,420.00	1,272
	0.19	182.19	0.337	0.208	0.0020	0.37	0.37	1,355.40	1,218
Indicated	0.09	230.54	0.279	0.179	0.0012	0.30	0.30	1,415.50	1,330
	0.11	222.19	0.285	0.184	0.0012	0.31	0.31	1,397.20	1,313
	0.13	210.99	0.294	0.190	0.0012	0.31	0.32	1,367.70	1,287
	0.15	197.17	0.305	0.197	0.0012	0.31	0.33	1,325.40	1,250
	0.17	181.06	0.318	0.206	0.0012	0.31	0.35	1,269.90	1,201
	0.19	165.25	0.332	0.216	0.0012	0.33	0.37	1,209.30	1,146
Measured & Indicated	0.09	483.90	0.281	0.176	0.0015	0.32	0.30	2,996.80	2,741
	0.11	466.60	0.288	0.180	0.0015	0.33	0.31	2,959.10	2,706
	0.13	442.36	0.297	0.186	0.0015	0.33	0.32	2,895.00	2,651
	0.15	413.30	0.308	0.194	0.0015	0.33	0.34	2,805.90	2,574
	0.17	379.79	0.321	0.203	0.0015	0.34	0.35	2,689.80	2,473
	0.19	347.44	0.335	0.212	0.0016	0.35	0.37	2,564.70	2,364
Inferred	0.09	91.83	0.206	0.146	0.0011	0.37	0.22	417.1	430
	0.11	86.24	0.213	0.151	0.0011	0.38	0.23	405.3	418
	0.13	80.64	0.22	0.156	0.0011	0.38	0.24	391	404
	0.15	73.18	0.229	0.163	0.0011	0.39	0.25	368.8	382
	0.17	65.82	0.237	0.17	0.0011	0.39	0.26	343.6	359
	0.19	56.1	0.248	0.179	0.0012	0.41	0.28	306.8	324

Notes: (1) Mineral resources are not mineral reserves and do not have demonstrated economic viability. **(2)** Mineral Resources are contained within a conceptual Measured, Indicated and Inferred optimized pit shell using the following assumptions: maximum copper recovery of 92% and maximum gold recovery of 90% based on the following equations: CuRec = 32.591xCu Grade+72.732 and AuRec = 33.871xAu Grade+75.29; assumed throughput rate of 60,000 t/d; Whittle constraining shell slopes between pit slope angles of 50º, waste and processed material mining costs of US$1.50/t, fill waste mining costs of US$1.23/t, total processing costs including reclamation of US$3.76/t, general and administrative costs of US$0.90/t, gold price of US$700/oz, and copper price of US$2.00/lb. **(3)** Copper equivalency was calculated using the formula CuEq = ([(%Cu) x (CuRec) x (22.0462) x ($lbCu) + (g/t/Au) x (AuRec) x 0.03216 x ($ozAu)]) ÷ ([(22.0462) x ($lbCu)]). **(4)** Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content. **(5)** Tonnage and grade measurements are in metric units. Contained gold and silver ounces are reported as troy ounces, contained copper pounds as Imperial pounds.

6.2.3 2012 Ajax Feasibility Resource

Tetra Tech completed a feasibility report on the Ajax deposit for Abacus in 2012. As part of this report, an updated resource was calculated for the Ajax deposit to include drilling completed after the cut-off date for the 2009 PEA report. Table 6-3 summarizes the results of this resource calculation. Details of the calculation can be found in Ghaffari et al (2012).

Table 6-3: 2012 Ajax Resource Summary at Various Grades

	Cut-off CuEq (%)	Tonnes (Mt)	CuEq (%)	Cu (%)	Au (g/t)	NSR (US$/t)	Contained Metal		
							CuEq (lb)	Cu (lb)	Au (oz)
Measured	0.1	322.5	0.38	0.27	0.17	13.83	2,667,000	1,933,000	1,734,600
	0.2	255.8	0.42	0.31	0.19	15.71	2,389,000	1,734,000	1,555,400
	0.3	179.4	0.50	0.36	0.23	18.84	1,982,000	1,437,000	1,306,200
	0.4	114.2	0.59	0.43	0.27	22.53	1,485,000	1,073,000	996,600
	0.5	68.5	0.68	0.49	0.32	26.53	1,032,000	743,000	705,200
Indicated	0.1	336.2	0.36	0.26	0.17	16.70	2,665,000	1,897,000	1,818,100
	0.2	256.2	0.42	0.30	0.20	19.98	2,399,000	1,712,000	1,637,400
	0.3	173.3	0.51	0.36	0.25	24.36	1,946,000	1,375,000	1,369,300
	0.4	110.0	0.60	0.42	0.30	29.26	1,463,000	1,024,000	1,052,900
	0.5	68.5	0.70	0.49	0.35	34.14	1,055,000	735,000	764,500
Measured + Indicated	0.1	658.7	0.37	0.26	0.17	15.30	5,331,000	3,830,000	3,552,600
	0.2	512.0	0.42	0.31	0.19	17.85	4,788,000	3,446,000	3,192,800
	0.3	352.6	0.51	0.36	0.24	21.55	3,928,000	2,811,000	2,675,500
	0.4	224.2	0.60	0.42	0.28	25.83	2,948,000	2,098,000	2,049,500
	0.5	137.0	0.69	0.49	0.33	30.34	2,087,000	1,478,000	1,469,800
Inferred	0.1	115.7	0.30	0.21	0.13	13.39	753,000	538,000	499,200
	0.2	73.7	0.38	0.27	0.17	17.46	613,000	439,000	405,700
	0.3	39.6	0.49	0.35	0.23	23.31	429,000	306,000	291,600
	0.4	20.2	0.63	0.45	0.30	30.65	281,000	201,000	192,000
	0.5	12.2	0.76	0.53	0.36	37.02	203,000	144,000	141,900

Notes: **(1)** Mineral resources are not mineral reserves and do not have demonstrated economic viability. **(2)** Mineral Resources are contained within a conceptual Measured, Indicated and Inferred optimized pit shell using the following assumptions: maximum copper recovery of 91.17% and maximum gold recovery of 86.49% based on the following equations: CuRec = (- 74.812 x (Cu%^2))+(85.727xCu%) +66.668 and AuRec = 92.586 x Au(g/t)^0.064; assumed throughput rate of 60,000 t/d; Whittle constraining shell slopes between pit slope angles ranging from 38° to 49°, waste and processed material mining costs of US$1.08/t, fill waste mining costs of US$0.89/t, total processing costs including reclamation of US$3.23/t, general and administrative costs of US$0.52/t, gold price of US$1,200/oz, and copper price of US$2.88/lb. **(3)** Copper equivalency was calculated using the formula CuEq = ([(%Cu) x (CuRec) x (22.0462) x ($lbCu) + (g/t/Au) x (AuRec) x (1/31.1035) x ($ozAu)]) ÷ ((CuRec) x (22.0462) x ($lbCu)). **(4)** Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content. **(5)** Tonnage and grade measurements are in metric units. Contained gold and silver ounces are reported as troy ounces, contained copper pounds as Imperial pounds.

6.2.4 2012 Ajax Feasibility Reserve

In addition to the updated resource calculated for the 2012 feasibility study, the first Ajax reserves were calculated based on expected costs for the project. Table 6-4 summarizes this reserve; details can be found in Ghaffari et al (2012).

Table 6-4: 2012 Ajax Reserve Summary

Category	Cut-off Grade ($/t)	ROM (Mt)	Avg. ROM Grades Cu (%)	Au (g/t)	CuEq (%)	Contained Copper (Mlb)	Contained Gold (Koz)
Proven Mineral Reserve	4.53	279.5	0.27	0.17	0.38	1,680	1,520
Probable Mineral Reserve	4.53	223.5	0.26	0.17	0.37	1,280	1,230
Total Proven & Probable	4.53	503.0	0.27	0.17	0.37	2,960	2,750

Notes: **(1)** Mineral Reserves are estimated using a cut-off grade of US$4.53/t NSR, a copper price of US$2.50/lb, and a gold price of US$1,085/oz. The NSR is calculated by adding the NSR attributable to copper to the NSR attributable to gold and then subtracting the freight costs, which include land freight, port charges, ocean freight and miscellaneous costs. The attributable copper is calculated using the metallurgical recovery obtained by the formula: CuRec (%) = -74.812 * Cu(%)2 + 85.727 * Cu(%) + 66.668 with a maximum copper recovery of 91.17%. The attributable gold is calculated using metallurgical recovery obtained by the formula: AuRec (%) = 92.586 * Au(g/t) 0.0649 with a maximum gold recovery of 86.49%. **(2)** Mineral Reserves are constrained within a pit shell, optimized using assumptions of a weighted average mining cost of US$1.32/t (ranging from US$0.92/t to US$2.50/t for the different mining benches); a processing cost of US$3.38/t (including US$0.51/t general and administrative costs, and US$0.05/t allocation for closure costs); and pit slope angles that vary from 40° to 49°. **(3)** A 0.5% mining loss factor was applied to account for dilution; diluted grades are estimated at 1.7% lower than the in-situ grades. **(4)** The life of mine, waste to ore strip ratio is 2.42. The assumed life-of-mine throughput rate is 60 kt/d. **(5)** The copper equivalency is calculated using the equation CuEq = [(%Cu) (CuRec) (22.0462) ($lbCu) + (g/t/Au) (AuRec) (1/31.1035) ($ozAu)] ÷ [(CuRec) (22.0462) ($lbCu)]. **(6)** Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content. **(7)** Tonnage and grade measurements are in metric units. Contained gold ounces are reported as troy ounces; contained copper pounds are Imperial pounds.

7 Geological Setting and Mineralization

7.1 Regional Geology

The Ajax deposit is located in Quesnel Terrane, volcanic arc terrane in the southern Intermontane Belt that runs the length of the Canadian Cordillera. The regional geology of the Ajax area is dominated by the Iron Mask Batholith, a late Triassic age multi-phase alkalic intrusive complex. The batholith is approximately 5 km wide and 22 km in length and trends northwest through the region (Figure 7-1).

The Iron Mask Batholith is classified as a multi-phase alkalic porphyry complex comprising Pothook Diorite (PHD), Iron Mask Hybrid (IMH), Cherry Creek Monzonite (CHMZ) and Sugarloaf Diorite (SLD). The rocks vary from fine-grained and porphyritic to coarse-grained, and are silica-poor, ranging from gabbro to syenite with diorite-monzodiorite-monzonite compositions predominating. U-Pb dating of the batholith has indicated an Upper Triassic age of 204 ±3 Ma (Mortensen et al, 1995).

Major systems of northwest and northeast trending fractures or faults controlled the emplacement of the various units. The northwest trending, northeast dipping Leemac Fault has been recognized in the Rainbow project area and may extend into the Ajax Project area, becoming the East Pit Fault. The northwest trending Cherry Creek Fault marks the contact between the Iron Mask Batholith and Nicola Volcanic units. Numerous northeast trending faults crosscut the Iron Mask Batholith. Shallow faulting has been recognized in the Ajax and Pothook pits as well as in the Galaxy project to the north of Ajax.

The Iron Mask Batholith intruded a sequence of Nicola Group flows and volcaniclastic rocks of mafic to intermediate composition. Nicola volcanics consist of extensive, thick sequences of subaerial and submarine mafic to intermediate flows, volcaniclastics and related sedimentary rocks. Adjacent to the Iron Mask Batholith, the Nicola Group rocks are characterized by basaltic to andesitic clinopyroxene phyric flows and flow breccias, light green massive tuffs and bedded ash to lapilli tuffs.

Lying stratigraphically above the Nicola Group, serpentinized picrite basalts occur as wedges or slivers caught up in major fault-related northwest trending, northeast dipping structural corridors within the batholith. Dykes of SLD occasionally cross-cut picrite and picrite xenoliths are occasionally found within the SLD unit, indicating that picrite pre-dated SLD. Mineral chemistry indicates that these ultramafic rocks represent mantle-derived material that has undergone minimal differentiation or crustal contamination and, based primarily on regional geology and whole rock and mineral chemistry, they represent ultramafic magmatism in an island arc setting (Snyder & Russell, 1994).

PHD (Figure 7-2) is the oldest phase of the Iron Mask Batholith and consists of a fine to medium-grained, equigranular plagioclase-pyroxene diorite with late poikilitic biotite (biotite containing plagioclase and pyroxene inclusions). PHD distribution suggests that emplacement was controlled by northwest and northeast-trending faults (Logan & Mihalynuk, 2005). The unit contains 15% to 25% euhedral to subhedral clinopyroxene, 5% to 15% poikilitic biotite and 5% to 15% magnetite. Plagioclase is often altered to sericite and potassium feldspar veinlets are common where PHD is in contact with CHMZ. These rocks consist of fine- to coarse-grained, generally equigranular pyroxene diorite to gabbro. Alteration is typically chlorite-epidote within variable potassium feldspar. Magnetite-apatite veins up to several metres wide occur within this unit.

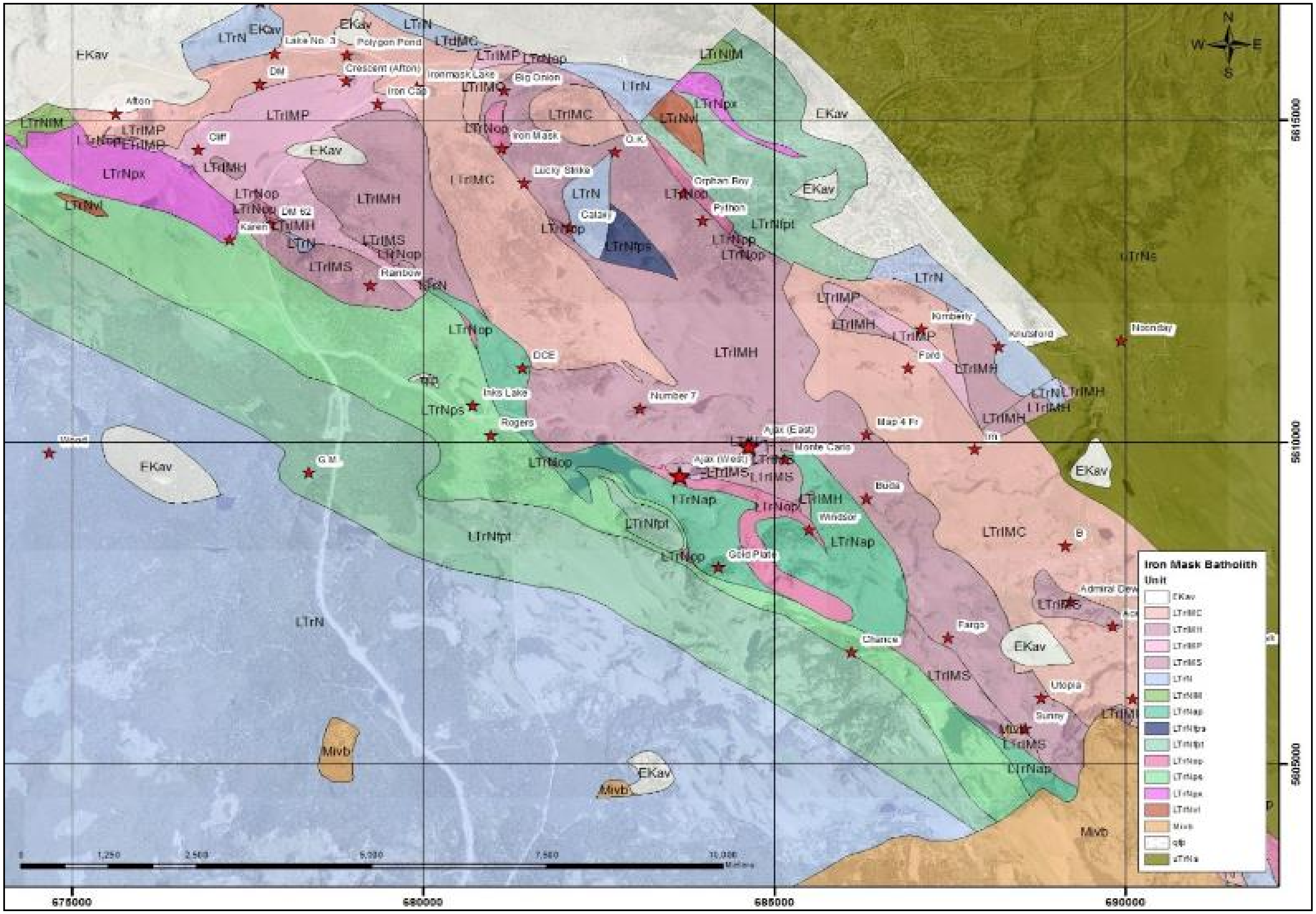


Figure 7-1: Geology of the Iron Mask Batholith (after Logan & Mihalynuk, 2006)

Figure 7-2: Pothook Diorite

IMH (Figure 7-3) is a strongly magnetic, heterogeneous intrusion breccia with variably assimilated Nicola Group volcanic clasts in PHD. Textures, alteration and mineralization are extremely variable within this unit. IMH typically contains fine to coarse, often pegmatitic, interlocking to subhedral pyroxene, hornblende, biotite, plagioclase and magnetite crystals. The unit typically shows weak propylitic alteration, with local potassic or albitic alteration. The unit is typically unmineralized but can contain localized pyrite and chalcopyrite, especially near the contacts with SLD units.

Figure 7-3: Iron Mask Hybrid (IMH)

The CHMZ phase (Figure 7-4) dominates the north and east margins of the batholith and forms a pluton northwest of the batholith. This phase postdates PHD and consists of leucocratic, fine to medium-grained, equigranular biotite monzonite to monzodiorite. Ubiquitous potassium feldspar generally gives CHMZ its pinkish colour.

Figure 7-4: Cherry Creek Monzonite (CHMZ)

SLD (Figure 7-5) dominates the western margin of the batholith and postdates PHD and CHMZ phases (Snyder & Russell, 1993). SLD is a light to medium grey colour, fine- to medium-grained porphyritic hornblende diorite. Albite alteration is common near zones of mineralization.

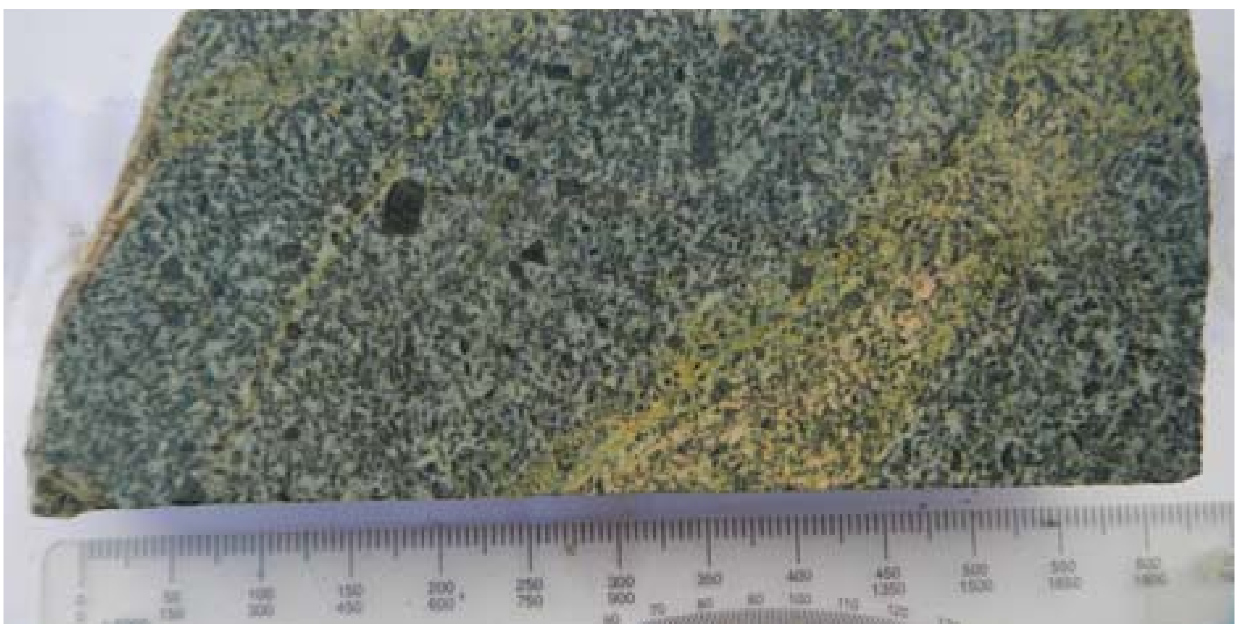


Figure 7-5: Sugarloaf Diorite (SLD)

The youngest rocks in the region are comprised of a Tertiary sequence of tuffaceous sandstone, siltstone and shale with minor flows and agglomerates of basalt and andesite composition belonging to the Kamloops Group.

7.2 Local & Property Geology

Outcrops are generally abundant in the Ajax area, in part due to the development of the West and East pits and haul roads. Historic surface mapping and geophysical survey data (induced polarization and magnetometer) have been supplemented by extensive diamond drilling in a number of areas on the property.

The Ajax deposit extends through four areas: the Ajax West pit and the Ajax East pit (where mining occurred from 1989-1991 and 1994-1997), the Saddle Area (between the East and West pits) and the Ajax East Extension (previously known as Monte Carlo). As many as 25 rock types have been recognized in the project area, some of which are hybrid units that resulted from the intermixing of two rock types (Figure 7-6). However, the main units can be grouped into 12 rock types. From oldest to youngest these are:

- Mafic Volcanics (MAFV)
- Picrite (PICR)
- Pyroxene Plagioclase Porphyry (PXPP)
- Iron Mask Hybrid (IMH)
- Aplite (APL)
- Sugarloaf Diorite (SLD)
- Sugarloaf Volcanic Hybrid (SVHYB)
- Late Sugarloaf Diorite (LSLD)
- Monzonite (MONZ)
- Lamprophyre (LMP)
- Latite (LAT)
- Basalt (BAS)

A thick sequence of Nicola Volcanic rocks lies to the south of and structurally below the SLD. These rocks include various fine-grained and pyroxene porphyritic mafic volcanics (Figure 7-7). MAFV unit is medium to dark green and non- to weakly magnetic.

The PICR unit (Figure 7-8) is generally dark green in colour, fine-grained and strongly magnetic and may contain up to 10% ovoid 1-8 mm relict olivine phenocrysts, now altered to serpentine and magnetite. The matrix generally consists of serpentine and tremolite-actinolite. These rocks are enriched in chromium and nickel. Chalcopyrite and pyrite may occur locally, typically near the contacts with SLD and SVHYB, but the picrite is generally unmineralized. Dark green, fine-grained MAFV, often containing 1 to 3 mm pyroxene phenocrysts, is interlayered with the PICR. The rock may be cut by up to 3% irregular calcite veins. Very minor (<1percentage) chalcopyrite and pyrite may occur locally, typically near the contacts with SLD and SVHYB.

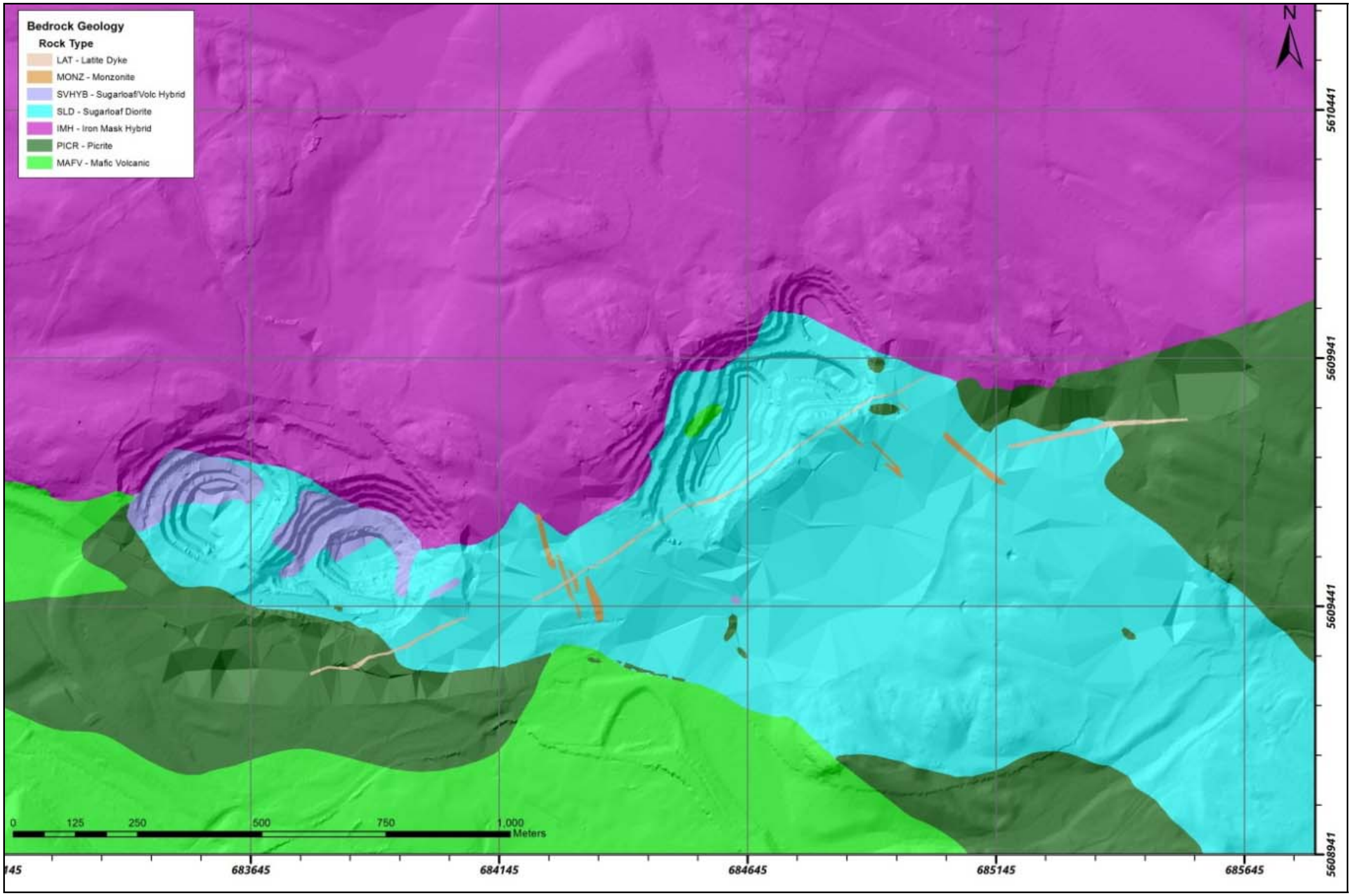


Figure 7-6: Ajax Property Geology

Figure 7-7: Mafic Volcanic (MAFV) with Epidote Alteration

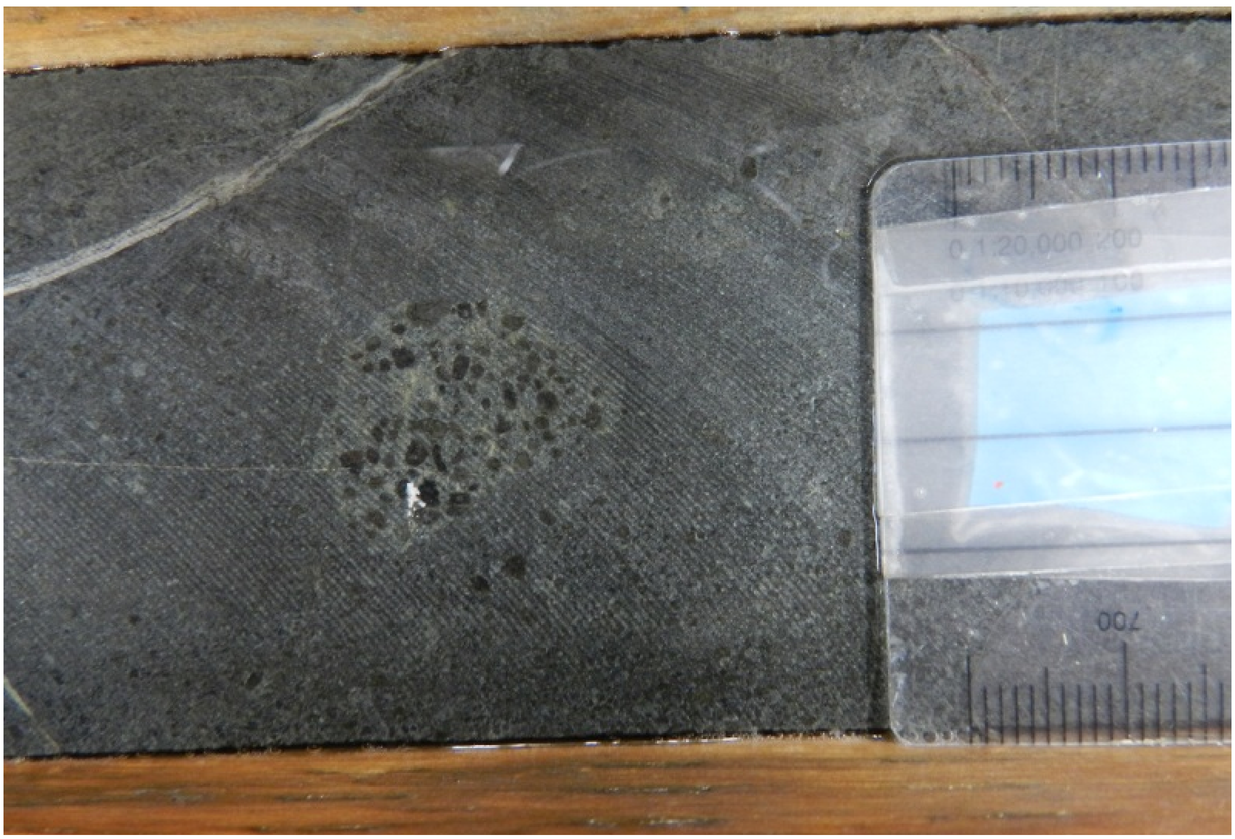


Figure 7-8: Picrite (PICR)

PXPP (Figure 7-9) has frequently been intersected in the deeper portions of many drill holes under the Ajax West pit, usually occurring between SLD and MAFV units. PXPP is generally medium to dark grey, consisting of up to 20% subhedral 1-5 mm pyroxene phenocrysts in a finer matrix of pale grey 1-3 mm plagioclase and dark fibrous amphibole. Plagioclase shows sericite alteration and the pyroxene phenocrysts have generally been replaced by amphibole. The rock has a local fragmental appearance. Pyrite content is typically 3% and magnetite varies from 0% to 10%.

Figure 7-9: Pyroxene-Plagioclase Porphyry (PXPP)

IMH is considered to be an assimilation of MAFV in PHD. IMH is heterogeneous, dioritic to gabbroic in composition, consisting of fine to coarse, interlocking subhedral pyroxene, hornblende, biotite, plagioclase and magnetite crystals. IMH is strongly magnetic and may contain up to 10% magnetite. Locally chalcopyrite and pyrite are present, increasing near the contacts with the SLD and SVHYB units.

Occasional narrow, light green, aphanitic and unmineralized APL dykes occur within IMH. These APLs dykes (Figure 7-10) cut the IMH but do not continue into any other units, leading to the conclusion that they are older than the SLD.

Figure 7-10: Aplite (APL)

The main host to mineralization, SLD (Figure 7-5), has intruded along the contact between IMH to the north and MAFV to the south. The contact trends northwesterly in the Ajax West Pit (dipping northeast) and changes to a southeasterly direction in the Ajax East Pit (dipping northwest). SLD is characteristically a light to medium grey colour, fine to coarse-grained, porphyritic diorite containing euhedral hornblende phenocrysts. It typically contains up to 20% subhedral to euhedral 1-10 mm hornblende phenocrysts and up to 20% tabular 1-5 mm plagioclase phenocrysts in a fine- to medium-grained plagioclase rich groundmass. Unaltered SLD may contain up to 5% fine-grained magnetite.

SLD often shows variable weak to intense albite alteration; the intense albite obliterates all original textures. Weak to moderate potassium feldspar alteration may also be present locally, as well as anhydrite and gypsum veining. Sulphide mineralization is most closely associated with albite alteration, and may consist of 1% to 10% combined pyrite and chalcopyrite with minor amounts of molybdenite and trace tetrahedrite and bornite. Up to 3% irregular calcite veins may be present locally.

The SVHYB (Figure 7-11) is a heterogenous rock that has resulted from SLD intruding and partially assimilating blocks of MAFV. This unit has a similar mineralization and alteration assemblage to that of the SLD. Along with the SLD, SVHYB is one of the main mineralized units on the Ajax property.

Figure 7-11: Sugarloaf Volcanic Hybrid (SVHYB)

The contact between SLD and IMH strikes southeasterly through the Ajax West area and changes to a northeasterly strike through the Ajax East area. The SLD-IMH contact is offset by a southeasterly striking fault (the East Pit Fault) at the north end of the East Ajax area. The whole sequence of units dips moderately to the north and northwest.

The LSLD (Figure 7-12) is a dark, porphyritic Sugarloaf unit with a fine-grained groundmass. This unit can be mineralized but is typically barren, and is thought to represent a later phase of SLD.

All units are cut by a series of unmineralized post-mineral dykes including MONZ, LAT and LMP. The dykes are up to 5 m wide and steeply dipping, with variable strikes, but most commonly follow the orientations of regional faulting. MONZ is typically pale, aphanitic to fine- to medium-grained and has small amounts of biotite, hornblende, pyroxene and magnetite. It is usually emplaced along northwest trending faults. LAT is light brown to greenish grey, with irregular calcite and potassium feldspar phenocrysts and occasional quartz eyes in a fine-grained groundmass, and tends to follow northeast trending faults. Rounded granite clasts up to a few centimeters are common, which can contain chalcopyrite and pyrite. LMP is a dark, fine-grained unit with phenocrysts of biotite and hornblende.

Figure 7-12: Late Sugarloaf Diorite (LSLD)

The youngest units seen at Ajax are the basalt dykes (BAS). This fine-grained unit has calcite-filled amygdules and may contain xenoliths of SLD and MAFV.

A sample of hornblende from the IMH collected approximately 800 m north of the Ajax West pit returned an Ar/Ar plateau age of 206.9 +2.2 Ma. Sericite defining foliation in “Foliated Pyroxene-Porphyritic Basalt” from the Ajax West pit contained a complex, very poor Ar/Ar plateau age of 205.6 ±1.3 Ma. Late stage potassium feldspar veins in the Ajax West pit yielded titanite grains which gave a U/Pb isochron age of 198.5 +4.5 Ma, but a poor Ar/Ar plateau age of 104.63 +0.67 Ma was returned for potassium feldspar grains, hinting at a much later hydrothermal event, perhaps not related to the main mineralizing phase (Logan & Mihalynuk, 2007).

7.3 Alteration

Albite alteration (Figure 7-13) is often found within the SLD and SVHYB units, but is also occasionally seen in the IMH, MAFV and PICR units when in close proximity to SLD. Intense albite alteration has locally destroyed rock textures, obscuring the original rock type (Figure 7-14). The albite alteration is in part controlled by fault and vein structures. Albitization acted as a precursor to mineralization, creating a brittle rock more susceptible to fracturing and infilling with sulphide mineralization.

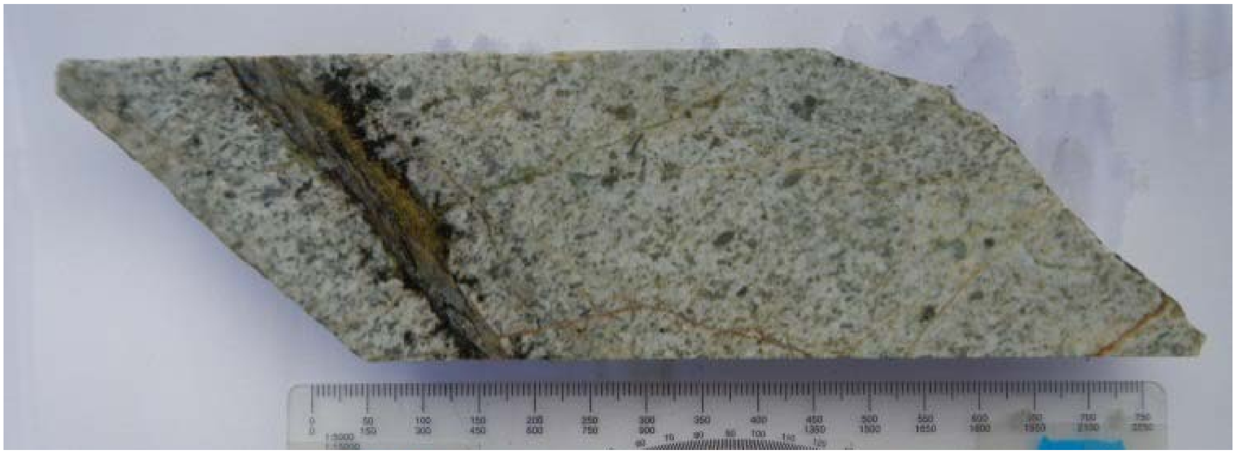


Figure 7-13: Strong Albite Altered SLD

Figure 7-14: Intense Albite Alteration

Potassium feldspar alteration (Figure 7-15) is commonly found in the SLD and SVHYB units. It is typically patchy or haloing fractures and can vary from weak to strong in intensity.

Sericitic or phyllic alteration has been observed across all units, typically with weak to moderate intensity. Distribution of possible phyllic alteration is not well understood.

Propylitic (chlorite, epidote and carbonate) alteration is common across all units, varying from weak to strong in intensity. It is typically a pervasive alteration best developed in more mafic phases.

Carbonate alteration is most commonly seen in the SLD and SVHYB units, but has been noted across all rock types and appears to be a regional alteration.

Lesser amounts of biotite and hematite alteration are also seen within the SLD, SVHYB and MAFV units at Ajax.

PICR is often moderately to strongly serpentinite altered, giving the unit a dark bluish green appearance. Fractures within the unit are often infilled with talc.

Figure 7-15: Potassium Feldspar Alteration in SLD

7.4 Mineralization

The Iron Mask Batholith is host to more than 20 known mineral deposits and occurrences. Copper-gold mineralization within the Iron Mask Batholith is associated with the younger intrusive phases of CHMZ and SLD. Mineralization is generally localized along major fault zones, at the contacts with the older PHD and IMH units and associated with albite and potassium feldspar alteration.

The mineralization in the project area is associated with structural corridors of highly fractured sections of SLD and SVHYB phases of the Iron Mask Batholith. Chalcopyrite is the dominant copper mineral and occurs as veins, veinlets, fracture fillings, disseminations and isolated blebs in the host rock. Concentrations of chalcopyrite rarely exceed 5%. Accessory sulphide minerals include pyrite and molybdenite (Figure 7-16).

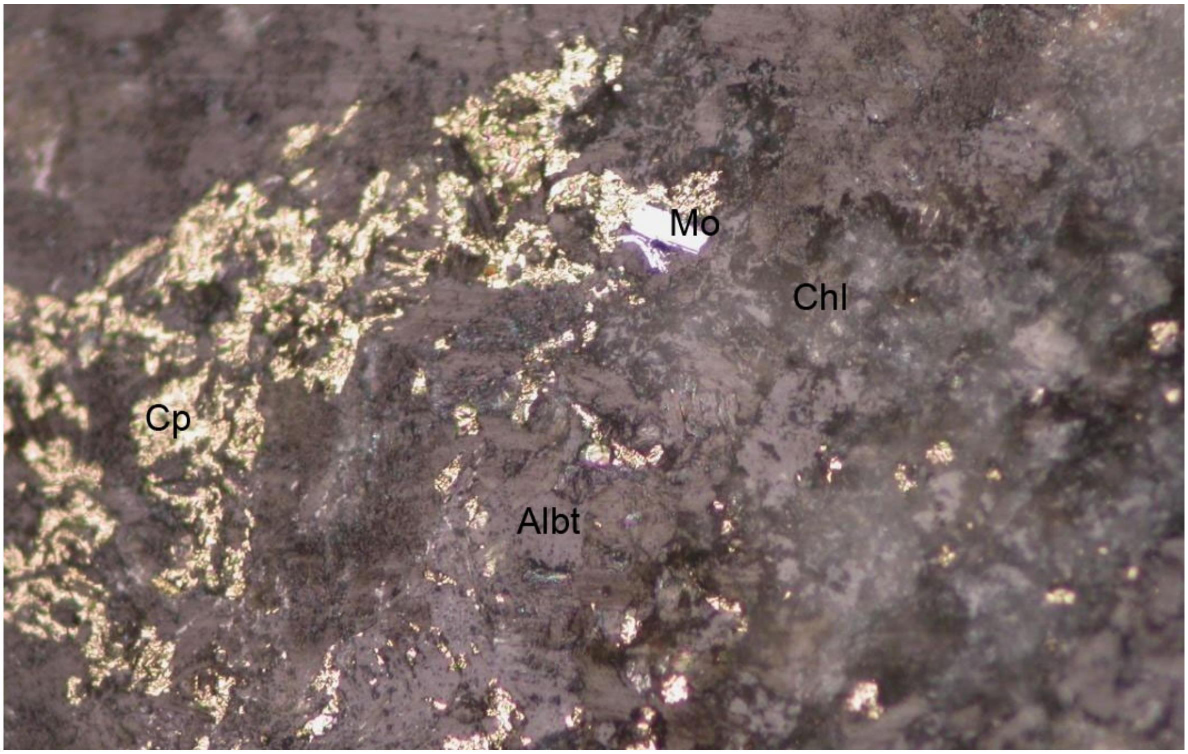


Figure 7-16: Chalcopyrite Grains with Molybdenite Grain in Strong Albite Alteration

Copper mineralization in the Ajax area consists predominantly of chalcopyrite and is hosted primarily in the SLD and SVHYB units. This mineralization appears to have greater concentration within the Sugarloaf units near the contact with IMH. Some mineralization is also seen within the IMH, MAFV, PXPP and PICR units near the contacts with Sugarloaf units, but mineralization drops off quickly with increasing distance from the contact. Chalcopyrite occurs as blebs and disseminations, in fractures, veinlets and micro-veinlets, as well as in occasional breccias and vugs with calcite. High-grade copper mineralization (>1.0% Cu) is confined to chalcopyrite vein systems. High-grade mineralization can extend several metres from the vein structure. Low-grade copper mineralization (0.10% to 0.50% Cu) is generally associated with the SLD-IMH contact. Drilling on the Ajax property has shown that mineralization extends to depths exceeding 700 m, widths exceeding 1,000 m and has a strike length exceeding 2,000 m.

Sulphide mineralization at Ajax also consists of pyrite and molybdenite. Pyrite is ubiquitous, occurring with chalcopyrite but also peripherally to the copper mineralization. Molybdenite is occasionally observed in SLD and SVHYB units, associated with potassium feldspar ± carbonate veins. Tetrahedrite has also been observed in trace amounts. Secondary copper oxides bornite and chalcocite occur infrequently.

Very minor amounts of the copper oxides malachite and azurite occur near surface. Native copper has also been observed locally.

As albite alteration was a precursor to mineralization, not all altered areas are mineralized. Where albitization is intense and texturally destructive, typically no copper mineralization is present. Intense albitization is interpreted to have rendered the SLD impermeable to mineralized fluids.

There are three copper mineralization/albite relationships:

- High-grade copper with weak to moderate albitization
- Low-grade copper with high albitization
- Barren copper with high albitization.

Gold mineralization is common and has a significant correlation with copper, but is very fine-grained and visible gold has not been observed in the core. Gold mineralization increases slightly in areas where strong albite alteration occurs (Wardrop, 2009). It is common for gold concentrations to be directly correlated with copper concentrations. It is infrequent for gold mineralization to occur without associated copper; however, in areas of moderate to strong potassium feldspar alteration, this can occur. Variable gold-copper ratios throughout the deposit suggest a series of pulses of gold-copper mineralization were emplaced. Spatial distribution of copper-gold ratios has pointed to at least three phases of mineralization in the Ajax West Pit but possibly only one in the Ajax East Pit (Bond, 1988). In addition, northwest trending faults seem to be offsetting copper mineralization and concentrating gold, possibly due to later remobilization along structures.

Minor palladium mineralization is associated with copper near the contacts of the IMH and SLD units (Wardrop, 2009). Minor amounts of silver have also been found.

7.5 Veining

Albite and potassium feldspar veins are typically observed in the SLD and SVHYB units, but are occasionally noted in IMH or MAFV as well, typically near the contacts with the two Sugarloaf units. Chlorite, dolomite, epidote, hematite, magnetite and occasional quartz veining have been observed in all units. Talc and/or serpentinite veining has been noted in the PICR unit. Gypsum and anhydrite veining have been observed at depth (Figure 7-17), typically below 100 to 200 m depth. Late calcite and carbonate veining are common throughout all units on the Ajax property.

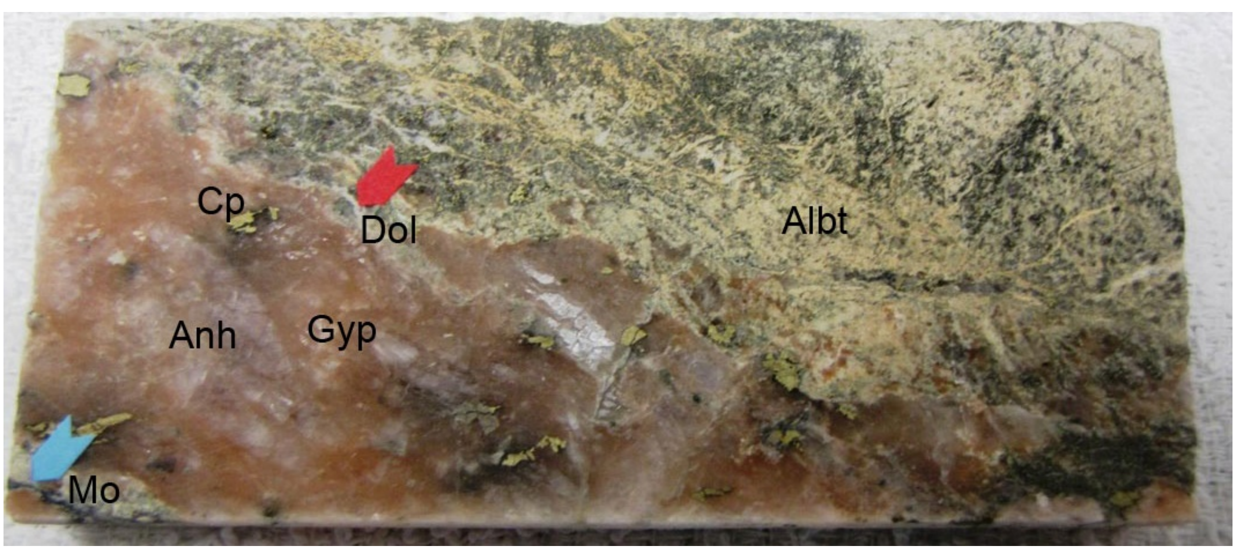


Figure 7-17: Gypsum-Anhydrite Vein with Chalcopyrite, in Strong Albite Alteration

7.6 Structure

Regionally, the Iron Mask Batholith is dominated by north to northwest-trending moderate to high angle faults that are considered to be deep seated, controlling deposition of volcanic and sedimentary rocks of the Nicola group as well as emplacement of the various phases of the Iron Mask Batholith. These structures were active as early as the mid-Triassic (Logan and Mihalynuk, 2005).

Structural corridors, defined as zones of brittle deformation, are recognized as favourable zones for mineralization. Structural corridors have been interpreted from surface mapping and magnetic surveys and generally define the outer boundaries of the batholith.

The northwest-trending Cherry Creek Fault, south of Jacko Lake, is the most prominent of these faults, but subparallel structures have been observed in the Ajax East and West Pit. The northwest trending Leemac Fault is the other major fault in the area, extending from the nearby Rainbow showing to the Ajax area, possibly becoming the East Pit Fault.

In the Ajax area, structures are dominated by several generations/orientations of steep faulting and a generation of flat thrust faults. Three main fault directions have been interpreted: northeast trending, northwest trending and west trending (Figure 7-18).

Two northeast trending, steeply dipping faults (A and Z) are interpreted to be the youngest structures and therefore cut off and offset other faults. The East Pit Fault (EP) and the East Pit Splay (EPS) are two northwest trending, steeply dipping faults which are easily seen in the northernmost part of the Ajax East Pit. The East Pit Fault causes evident offset to both lithology and mineralization. Faults KV and T were interpreted from mapping and regional magnetic mapping, and are also northwest trending and steeply dipping; these are interpreted to be the oldest faults in the area but may have been reactivated at a later date.

It appears that both the northwest and northeast structures are offsetting SLD and mineralization; however, the offset along the northwest structures is more significant than across northeast faults. An east trending fault (IJ), first interpreted by Ross (1993), cuts across the western half of the Ajax West Pit. Based on drill data and observations in the pit, there is no evidence that this fault is extensive, and it appears to terminate at faults A and Z. Two shallow dipping, approximately east trending faults (CSO) were interpreted based on observations of the pit walls and copper grade offsets in the drilling. The first is in the area of the East Pit and the second is in the area of the West Pit although it does not extend to surface. The timing and relationship of these flat-lying faults to the other structures is unknown.

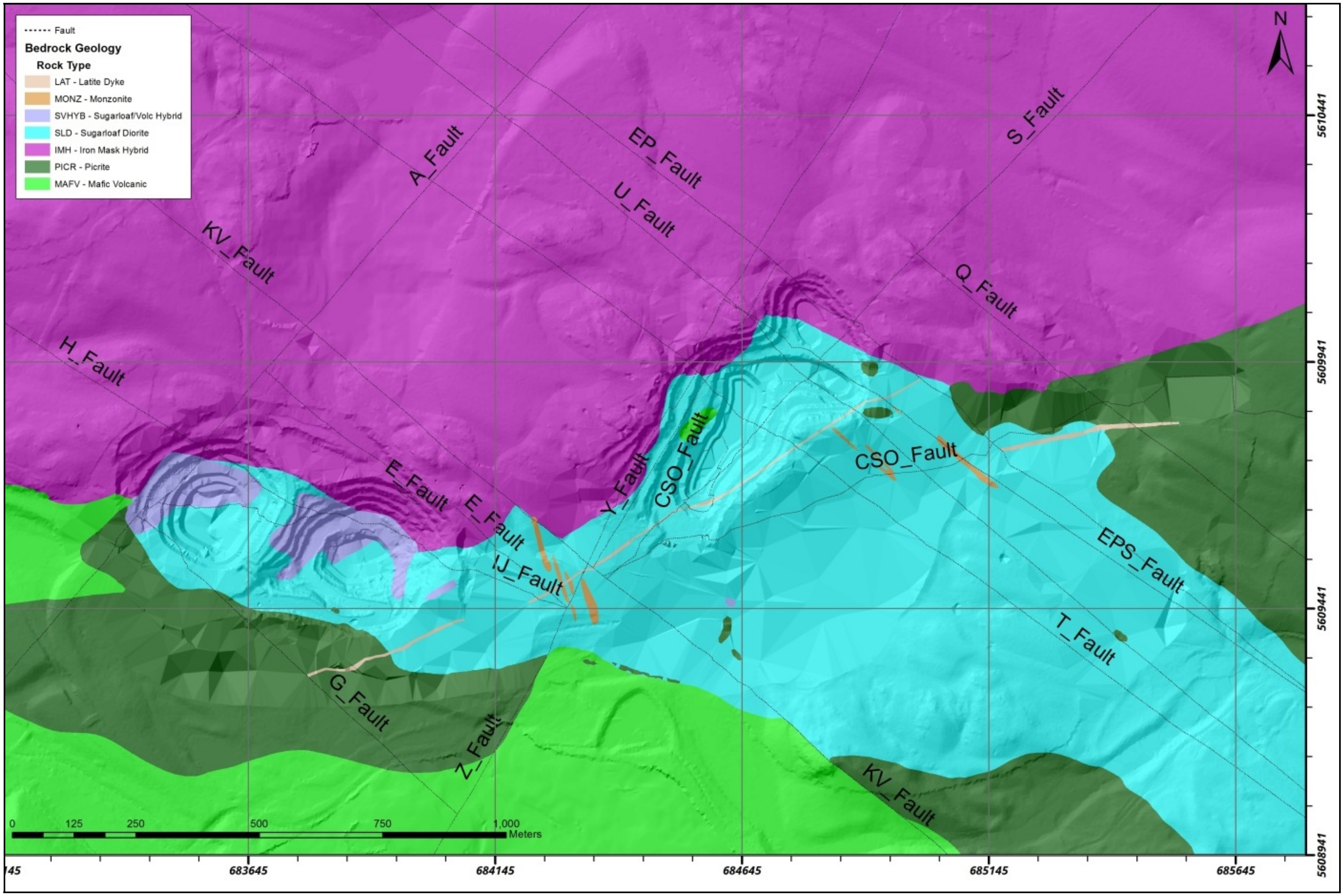


Figure 7-18: Interpreted Faults

7.7 Surficial Geology

The surficial geology and geomorphology of the area is reflective of extensive glacial processes including the development of surface lineations and the deposition of till blanket (GSC, 1995). The valleys in the Ajax area are characterized as morainal deposits consisting of drumlinized glacial till. Remnant glaciolacustrine deposits occur just north of the Afton pit and coarse colluvium deposits occur near Sugarloaf Hill (Knight Piésold, 2009).

Overburden material encountered during drilling and trenching has typically consisted of clays, fine-grained silts and coarse sand and gravel. Overburden thickness in the Ajax area can vary widely; from zero to 83 m. Organic cover is present across the project site in undisturbed areas and primarily consists of vegetative root mat, with silt, sand, and organic matter in varying proportions. Based on 93 test pits and 26 boreholes completed across the property in 2010 and 2011, the mean thickness is approximately 0.3 m and ranges between 0.0 m and 1.0 m.

Glacial till materials were encountered at most test holes across the project site (Figure 7-19). The glacial till was generally encountered immediately below the organic cover and is described as sandy silt with minor clay and trace to minor gravel, ranging to silty-sandy gravel with trace clay. Till near the ground surface has higher fines content at some test locations found within topographic lows. The relative density of the glacial till is variable and generally ranges between compact to dense, increasing to very dense with depth in many areas of the site.

Figure 7-19: Soil Profile from Test Pit

Materials encountered near the location of the proposed crusher are understood to be waste rock from previous mining activities. This material is made up of boulders and cobbles within a sandy, gravelly matrix. Subsurface observations of these materials were made using both the test pits and the ODEX drilling, indicating a maximum fill thickness of approximately 17 m in the higher ground in the general vicinity of the proposed crushers. There was no fill observed in the lower ground near the toe of the old waste rock dump. Fill was encountered in the southern portion of the east dump, in the location of an old gravel pit. The material was made up of sand and gravel and has a thickness of approximately 5.8 m.

8 Deposit Types

Mineral deposits of the Iron Mask Batholith generally fall into the alkalic copper-gold porphyry type. Five such porphyry deposits have been mined by open pit methods by various operators since the 1970s. Ajax, the primary focus of this report, is a large tonnage, low-grade alkalic porphyry deposit. The Afton, Pothook, and Crescent deposits are approximately 9 km northwest of the Ajax area. Copper-gold mineralization has also been identified at the Rainbow property, 6 km northwest of Ajax area. The Galaxy deposit, north of Ajax also falls into this deposit type.

Mineralization in the Iron Mask Batholith is typically associated with the Sugarloaf and Cherry Creek phases where they are in contact with the older Pothook and Iron Mask Hybrid phases. Chalcopyrite is the dominant copper mineral with subordinate bornite, chalcocite, copper carbonates, and native copper that were present locally in supergene zones at Afton, in particular. Gold and silver mineralization is common and has a significant correlation with copper. Molybdenum and palladium are very minor constituents at Ajax.

Alteration of host rocks at Ajax is dominated at its core by albite. Albite was likely introduced early in the mineralizing event, providing a strong control for subsequent mineralization. Potassic alteration in the form of potassium feldspar and lesser biotite is an important but subsidiary phase though dominant in the Pothook and Cherry Creek phases. A propylitic assemblage of pyrite, chlorite, and epidote is widespread.

Structural corridors, defined as zones of brittle deformation, are recognized as favourable zones for mineralization. Structural corridors have been interpreted from surface mapping and magnetic surveys and generally define the outer boundaries of the batholith.

9 Exploration

Since KGHMI took over as operator of the Ajax Project in 2012, significant exploration has been completed throughout KAM's claim package. Exploration has consisted of geophysics and drilling both in and adjacent to the Ajax deposit and at prospects in the area surrounding Ajax.

9.1 KGHM Exploration Work

9.1.1 Geophysics

9.1.1.1 Induced Polarization Survey

SJ Geophysics completed an Induced Polarization (IP) survey for KGHM between January and March of 2013. The survey covered most of the eastern portion of KGHM's claim block, extending from the eastern edge of a previous survey completed by Abacus in 2003 (Rainbow area), to the eastern claim boundary. The two surveys were stitched together to create continuous coverage from the western side of the Rainbow deposit through the Ajax deposit and on to the eastern boundary of KGHM's claim block (Figure 9-1).

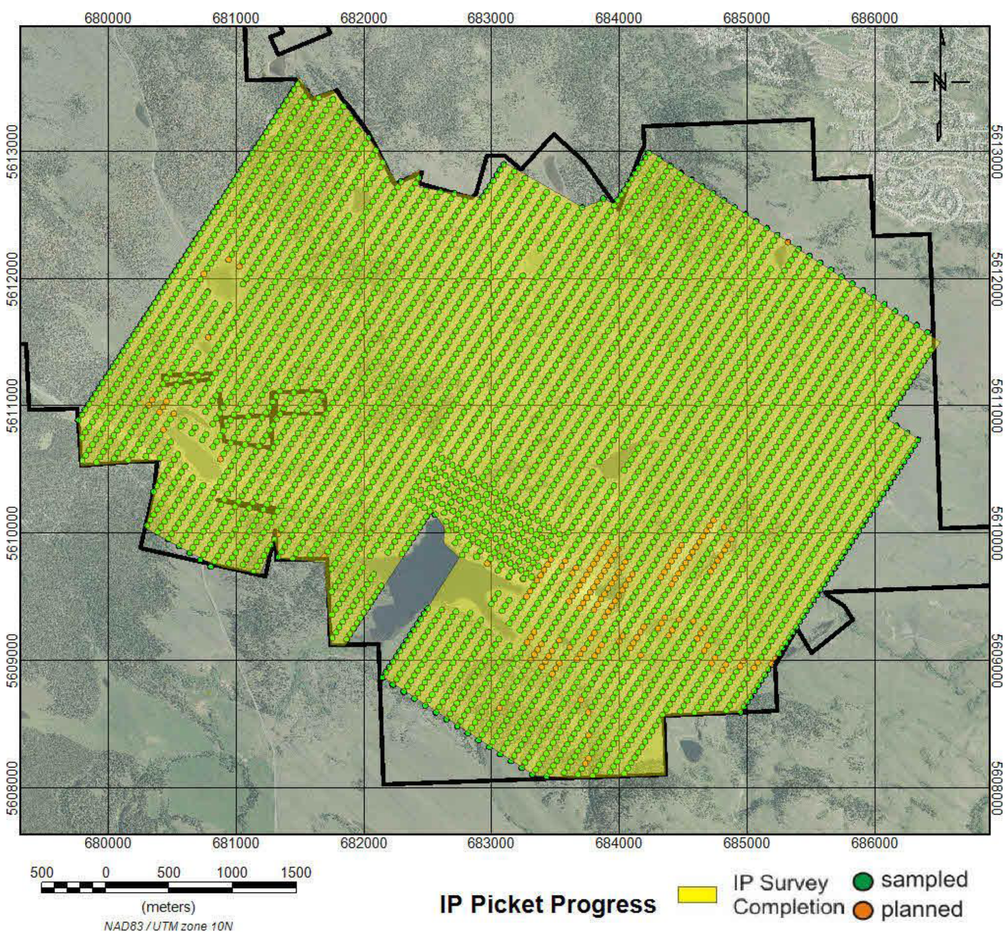


Figure 9-1: 2013 IP Survey Grid

The survey was a modified offset pole-dipole (3D) survey, with current injection at 50 m intervals comprising approximately 220 line km. Data was collected along a 1,200 m long survey array with two receiver lines and three transmitter lines that acquired data simultaneously using the SJ Volterra-3DIP System.

9.1.1.2 Airborne Magnetics Survey

In June 2014, CGG Canada Services Ltd. performed an HM1 stinger-mounted airborne magnetic geophysical survey for KAM. The roughly 5 km x 20 km survey block was centered on the Ajax property and encompassed 1,146 line km. Flight lines were spaced 100 m and flown 40° east of north while tie lines were flown every 1000 m in an orientation 130° east of north.

9.1.2 Drilling

KAM completed multiple drilling programs at Ajax between 2012 and 2015. Diamond drill holes consisted of both NQ (47.6 mm diameter) and HQ (63.5 mm diameter) size core. Some drill holes were completed with an NQ3 (44.0 mm diameter) or HQ3 (61.1 mm diameter) drill bit where ground conditions required the use of triple tubes. Details of the KAM drill programs completed at Ajax are given in Section 10 of this report. Details of the drilling completed at the Rainbow, DM-Audra-Crescent and Coquihalla prospects can be found in Sections 9.3.1, 9.3.2 and 9.3.3, respectively.

9.2 Previous Operators Exploration Work

Previous operators explored the Ajax property using geophysics, geochemistry, and drilling. The exploration history of the Ajax property is described in Section 6.0. Exploration work carried out by previous operators is summarized in Table 9-1.

Table 9-1: Summary of Exploration Programs by Previous Operators

Year	Company	Activity
1916	Granby	DDH
1929	CM&S	DDH
1952	Berens	DDH
1954	CM&S	Geophysics
1955 to 1957	CM&S	DDH
1961	CM&S	DDH
1967	Cominco	Geophysics & DDH
1972 to 1973	Afton Mines	Geophysics & Percussion Drilling
1980	Cominco, E&B	Geophysics & Percussion Drilling
1981	Cominco, E&B	Percussion, DDH
1987 to 1990	Afton OC	DDH
1995 to 1996	Afton OC	DDH
2004	DRC (New Gold)	DDH
2005	Abacus	DDH
2006	New Gold	DDH
2007	Abacus	DDH
2007	New Gold	DDH
2008 to 2011	Abacus	DDH

9.3 Prospects

KAM controls other exploration prospects near the Ajax property.

9.3.1 Rainbow

The Rainbow zone is located approximately 6 km northwest of the Ajax area. The Rainbow area is underlain by Late Triassic Nicola Group rocks intruded by Pothook Diorite (PHD), Sugarloaf Diorite (SLD) and Iron Mask Hybrid (IMH) phases of the Late Triassic Iron Mask Batholith. The Rainbow area has been explored intermittently since the late 1800s by numerous operators.

In 2005, Abacus reported a resource at Rainbow (Darney, Friesen and Giroux 2005a, 2005b) however, high level economic evaluations were completed for this area in 2009 and it was concluded that it does not meet currently reasonable prospects for economic extraction. More favourable economics may make this project viable in the future.

KAM completed additional drilling at Rainbow in 2013 and 2014. In 2013, KAM drilled three holes totaling 1,389 m targeting underexplored areas in the No. 1 zone. Unfortunately, no significant copper-gold mineralization was identified.

The 2014 KAM drilling program in the Rainbow area consisted of five NQ/HQ diamond drill holes totaling 2,983 m and ranging in length from 400-700 m. Several shorter intercepts of copper-gold mineralization were identified in the 2014 drill program.

9.3.2 DM-Audra-Crescent

The DM, Audra and Crescent zones are located approximately 1 km east of New Gold's New Afton copper-gold deposit and approximately 8.5 km northwest of the Ajax deposit. The area is underlain by Nicola Group rocks intruded by Cherry Creek Monzonite (CHMZ) and Pothook Diorite (PHD) phases of the late Triassic Iron Mask Batholith. Most of the mineralization in the DM-Audra-Crescent area appears to occupy the contact between CHMZ and PHD hosted in a late phase of the CHMZ known as Cherry Creek Breccia (CCBX).

Mineralization at the DM-Audra-Crescent zone occurs over widths of 20 m to 200 m and has been drill tested over a strike length of 800 m with 177 drill holes. Drilling has only been tested to a depth of roughly 300 to 600 m. Mineralization at DM-Audra remains open along strike to the east and west and remains open at depth.

In 2005, Abacus reported a resource at DM-Audra (Darney, Friesen and Giroux 2005a, 2005b); however, high-level economic evaluations were completed for this area in 2009 and it was concluded that it does not meet currently reasonable prospects for economic extraction. More favourable economics may make this project viable in the future.

KAM completed additional drilling at DM-Audra-Crescent in 2014 and 2015. The 2014 drilling program in the DM-Audra-Crescent area consisted of 16 NQ/HQ diamond drill holes totaling 11,095 m and ranging in length from 400 m to 700 m.

The 2015 drilling program in the DM-Audra-Crescent area consisted of three diamond drill holes totaling 2,115 m and ranging in length from 535 m to 800 m.

9.3.3 Coquihalla

The Coquihalla Zone, located approximately 2 km southeast of New Gold's New Afton deposit, lies within the highly prospective northwest-trending Leemac structural corridor. The Coquihalla area is underlain by Nicola Group rocks to the south and PHD rocks to the north and is intruded by a series of weakly mineralized SLD dikes. The Coquihalla Zone shows a strong IP chargeability anomaly associated with a few widely spaced drill holes, most of which have only been drilled to a depth of 180 m. Gold and copper grades from exploration drill core samples are encouraging, but no geological model has been constructed on the zone due to the limited drilling. Thus, it is not possible to determine the potential for a more extensive mineralized system.

Four drill holes were completed in July and August of 2014 to follow up on historical copper-gold intersections and to test the depth and continuity of the known mineralization. Each drill hole tested the edge of the IP chargeability high in areas near known mineralization identified by historic drilling that appear to be open at depth. The 2014 drilling program in the Coquihalla area consisted of four NQ/HQ diamond drill holes totaling 2,009 m and ranging in length from 400 m to 500 m.

10 Drilling

The Ajax area was drilled as early as 1916 and since that time, more than 1,276 drill holes have been completed in the area totaling 297,687 m (Table 10-1). Most early drilling, from 1916 to 1980, is poorly documented. Historic drilling on the Ajax property was concentrated in the areas of the open pit mines that were in production in the 1980s and 1990s.

Table 10-1: Summary of Drill Campaigns

Year	Company	Drill Type	Used for Resource Model	No. of Drill Holes	Meterage
1916	Granby	DDH	No	Unknown	Unknown
1929	CM&S	DDH	No	13	865
1952	Berens River	DDH	No	4	421
1955	CM&S	DDH	No	14	2,168
1956	CM&S	DDH	No	6	923
1957	CM&S	DDH	No	12	1,533
1961	CM&S	DDH	No	2	306
1967	Cominco	DDH	No	8	1,269
1973	Afton Mines Ltd.	Percussion	No	55	4,666
1980	Cominco, E&B	Percussion	No	186	15,880
1981	Cominco, E&B	Percussion, DDH	Yes (DDH only)	70	7,172
1987	Afton OC	DDH	Yes	77	11,669
1988	Afton OC	DDH	Yes	16	2,518
1989	Afton OC	DDH	Yes	5	1,493
1990	Afton OC	DDH	Yes	13	3,507
1995	Afton OC	DDH	Yes	8	1,710
1996	Afton OC	DDH	Yes	1	155
2004	DRC (New Gold)	DDH	Yes	6	2,016
2005	Abacus	DDH	Yes	5	2,714
2006	Abacus	DDH	Yes	50	25,811
2006	New Gold	DDH	Yes	4	2,620
2007	Abacus	DDH	Yes	88	41,104
2007	New Gold	DDH	No (Outside area of interest)	13	5,838
2008	Abacus	DDH	Yes	112	47,666
2009	Abacus	DDH	Yes	21	7,855
2010	Abacus	DDH	Yes	127	30,963
2011	Abacus	DDH, AR (Water Wells)	Yes (DDH)	45	1,646
2012	KGHM	DDH	Yes	2	560
2013	KGHM	DDH	Yes (If in area of interest)	118	25,577
2014	KGHM	DDH	Yes (If in area of interest)	161	39,164
2015	KGHM	DDH	No (Cut-off date Feb 2015)	38	13,429.12
Total				**1,276**	**297,687**

10.1 Historic Drill Campaigns

Documentation for the drilling campaigns completed in the Ajax area before 1981 is limited or not available. Lack of documentation limits the amount of pre-1981 drill data that was included in the 2015 resource model database.

Drilling campaigns completed during the period 1980 to 1996 have limited documentation generally consisting of geological logs, survey information, and assay certificates. This has been entered into the Ajax drill hole database and original information is stored in drill files located at the Ajax Site office located near Kamloops, B.C.

The resource database includes 665 drill holes totaling 208,050 m of drilling. DDH methods were used to complete 100% of the drilling included in the 2015 resource model database. All Ajax drill campaigns are summarized in Table 10-1 and flagged to indicate whether they were used in this resource update. Figure 10-1 shows the spatial distribution of the drill holes used in the resource model database.

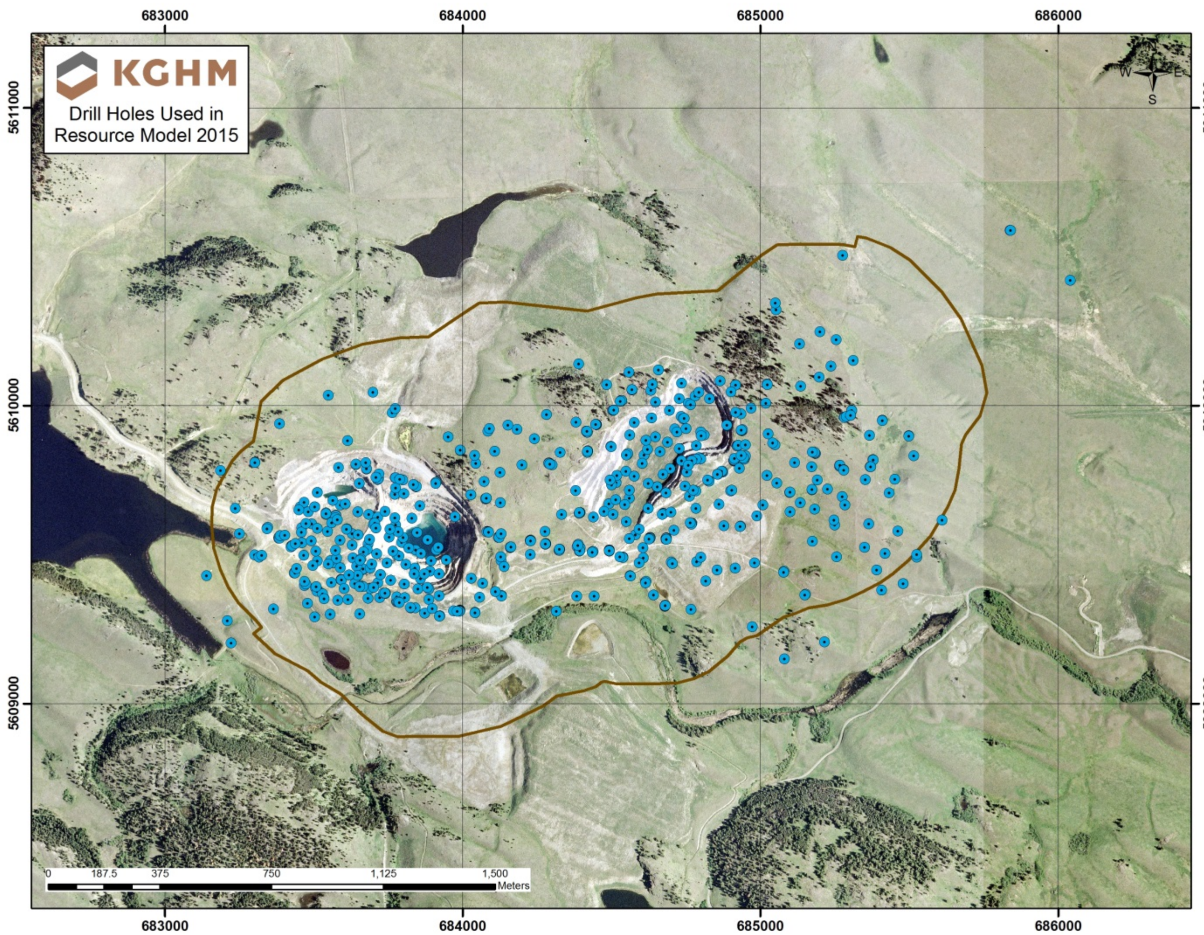


Figure 10-1: Spatial Distribution of Drill Holes Used in the 2015 Resource Model

10.1.1 Cominco Campaigns (1980 WT-Series)

Documentation for Cominco WT-series drill holes drilled in 1980 is limited to geological descriptions and sample results for each hole. These drill holes were reported to be vertical percussion drill holes that were less than 100 m in length. The collar locations were obtained from historic maps, and indicate WT drilling was completed on a grid spacing of 100-150 m. There is no documentation regarding drilling, sampling, or laboratory protocols. Generally, the WT drilling has been replaced with more recent drilling mostly completed by Abacus and added to by KGHM; this campaign was not included in the resource model database.

10.1.2 Cominco Campaigns (1981 J-, NM-, DDH81, DDH Series)

Documentation for Cominco J- and NM-series drill holes is limited to drill hole listing reports, which detailed the collar locations, azimuth and dip, and assay results but no geological information. These were vertical percussion drill holes that were less than 100 m in length. The J-series drilling was confined to the areas of what are now the Ajax East and West open pits. The drilling was completed on a grid system of 25 to 50 m. Significant portions of many of these drill holes were mined in the 1980s and 1990s during periods of open pit mine production. Generally, the J drilling has been replaced with more recent drilling mostly completed by Abacus and added to by KGHM; this campaign was not included in the resource model database.

Drill logs and assay results for 14 DDH81-series of diamond drill holes were found in the Kamloops office in May 2013. The technical services team verified the data in 2013 and XYZ coordinates from digitized maps were found to be accurate. The data was entered in the Fusion database and was used in the 2015 resource estimation.

Paper logs for 42 DDH-series of diamond drill holes completed by Consolidated Mining & Smelting from 1955 to 1957, 1961 and 1967 were also found in the Kamloops office. These logs corresponded to data from Cominco's 1981 drill hole results, which indicated that the holes had been re-assayed in 1981. The data for these holes were also verified by the technical services team and added to the database and used in the 2015 resource estimation.

10.1.3 Afton Campaigns (1987 – 1990 TCK-Series, 1995-1996 AW-Series)

Documentation for Afton diamond drilling campaigns from 1987 to 1996 consisted of geological logs and assay certificates. The drill holes had an average depth of 150 m. Typical depths ranged from 100 to 200 m. The deepest hole was 350 m. The drill core was NQ-size (47.6 mm diameter) and is available at core farms near the Afton mill site. The drill core was stored in wooden core boxes and stacked in core racks. The core boxes and racks are showing very advanced stages of weathering. There is no information regarding drilling and sampling protocols. The drilling procedures are not documented.

10.2 New Gold Campaigns (2004 & 2006, AX-Series)

New Gold completed ten drill holes totaling 4,377 m in the Ajax area in 2004 and 2006. The 2004 drilling was completed using NQ-sized core; 2006 drilling was collared with NQ-size and reduced to BQ-size at depth. Of the ten drill holes, AX04-06 had only two samples near the collar and AX04-05 was not sampled at all. The core from the New Gold campaigns is now stored in KGHM's core yard located at the Ajax site office. All nine of the sampled holes were used in the 2015 mineral resource estimate.

10.3 Abacus Campaigns (2005-2011, AE-, AM-, AN- & AW- Series)

Abacus drill campaigns comprise approximately 68% of the drill data in the resource model database. Documentation for Abacus drilling campaigns from 2005 to 2011 consists of geological logs, assay certificates, and survey reports. Most drilling was completed with NQ core but a few drill holes were completed with BQ core tails. The drill core is stored in wooden core boxes and stacked in covered core racks at the Ajax site office near Kamloops where the drill hole files are kept.

10.3.1 Abacus Drilling Procedures & Conditions

All Abacus drilling was completed with DDH methods. Drilling commonly collected NQ-size core (47.6 mm diameter) using a 10 ft (3.04 m) core barrel. Due to reduction while drilling, seven drill holes had BQ size (36.4 mm diameter) tails.

Drill hole collars were marked in the field with a wooden post placed in the drill hole. A metal tag was attached to the post, identifying the drill hole. The collars were surveyed with a total station.

10.3.2 Geological Logging

The core logging facilities used by Abacus (now the KAM site office and core facilities) were excellent and designed for all-season use. There is a reference core library and the drill core was photographed wet, prior to splitting.

Abacus drill core was logged for geology on paper forms by an Abacus geologist; that information was subsequently entered into the North Face Software Limited's "Lagger 3D Exploration" core logging software.

10.3.3 Geotechnical Logging

Geotechnical logging was conducted for each core interval and consisted of rock quality designation (RQD) determination, core recovery, and other rock mass rating parameters including number of joints, weathering, rock hardness, and joint angle. The geotechnical information was recorded on a separate logging form and entered into a computer spreadsheet.

10.3.4 Drill Collar & Down Hole Surveys

Collar locations for the Abacus 2005 to 2011 drill campaigns were surveyed by Ward Garroway, an independent survey contractor in Kamloops, B.C., using a Leica T1610 Total Station.

The majority of Ajax drilling completed by Abacus was oriented along drill sections with a 28° azimuth (True North), approximately perpendicular to the strike of the mineralization (Figure 10-1). A series of sections in the East pit area were oriented at 118° azimuth to accommodate a change in strike of the mineralization in that area. The drill holes commonly had inclinations of -45° to -85°. Some holes were vertical.

During the process of diamond drilling, Abacus personnel completed down hole surveys using an Icefield MI3 Multi-Shot. In 2008, Abacus began using a Reflex Ez-Trac. An acid etch method was used to measure the dip of the drill hole when the deviation survey tool was not functioning or not available.

10.3.5 Magnetic Susceptibility Study

A summary of a magnetic susceptibility study conducted by AMEC, taken from the 2011 Feasibility Study Technical Report completed for Abacus by Wardrop Engineering Inc., is as follows:

> *Disseminated magnetite, commonly observed in drill core and locally in veins, may exceed 5% in abundance. Both the Ice Field and Reflex survey tools used for deviation surveys use a magnetic instrument to obtain azimuth readings. Concerns regarding the reliability of the azimuth data due to the presence of magnetite observed*

in drill core resulted in a detailed review of the deviation survey data by AMEC. The magnetic susceptibility data were evaluated to determine the influence of magnetite on the deviation surveys.

Minimal correlation was observed between magnetic susceptibility readings, magnetite observed during geological logging, and deflections present in the deviation azimuth data. It was concluded that the deviation surveys are reasonable and suitable for use in the resource model to spatially locate mineralized intercepts.

10.4 KAM Drill Campaigns within the Ajax Deposit (2012 to October 2015, KAX- Series)

KAM has completed an additional 321 diamond drill holes totaling 78,730.2 m in the Ajax deposit between the years 2012 and 2015. KAM drilling makes up 17% of the drill data in the resource model. Multiple programs were completed both to expand and infill the deposit as well as to supply samples for metallurgical test work. In addition, several geotechnical holes were completed to aid in pit wall design; these holes were not specifically designed to test mineralization but were sampled throughout the length of the hole if mineralization was observed. Figure 10-2 on the following page shows the collar locations of the drill holes completed within the Ajax pit area by KAM.

10.4.1 2012 Metallurgical Drill Program

Two HQ-sized holes were completed to provide material for a small pilot plant test program. In total, 560 m were drilled with one hole drilled under the Ajax West pit and the other under the Ajax East pit.

10.4.2 2013 Geological Program

In January and February 2013, three HQ3 diamond drill holes totaling 911.5 m were completed along the western edge of the proposed Ajax pit. These holes were primarily designed to obtain additional geotechnical data for pit wall design work; however, they were sampled and analyzed wherever mineralization was observed in the core, to add to the Ajax drill hole database.

10.4.3 2013 Metallurgical Drill Programs

In 2013, KAM completed two drill programs utilizing HQ-size diamond drill core to supply material for metallurgical testing. Holes from both of these programs were spread throughout the proposed Ajax pit area to achieve a planned blend of Ajax ore types.

The first program was completed in April and May and consisted of 18 drill holes totaling 3,338 m of drilling.

The second program was completed in July and August and consisted of 21 drill holes totaling 3,115.2 m.

10.4.4 2013 Geotechnical Drill Program

Between November 2013 and January 2014, nine HQ3 diamond drill holes totaling 3,600.0 m were completed within the proposed Ajax pit area. These holes were primarily designed to obtain additional geotechnical data for pit wall design work; however, they were sampled and analyzed throughout to add to the Ajax drill hole database.

10.4.5 2014 Jacko Lake Hydrogeological Program

From late February to early May 2014, seven diamond drill holes were completed as part of a hydrogeological program that was designed to test the area between the proposed Ajax pit and Jacko Lake. This program focused on the area between the pit and lake to determine hydraulic connectivity and aid in pit design. However, the drill holes were logged for geology and assayed where mineralization was observed. In total, 1,254 m were drilled. Two holes were started with PQ-size core and completed as HQ.

10.4.6 2014 Metallurgical Drill Program

In March 2014, 13 HQ-size diamond drill holes totaling 3,155 m were completed within the proposed Ajax pit area. These drill holes were spread throughout the proposed Ajax pit to collect representative ore types for metallurgical testing.

10.4.7 2014 In-Pit Exploration Program

During 2014, KAM completed two drill programs in and adjacent to the Ajax deposit, to test for the extension of mineralization to depth and to the northeast, and to infill areas to support resource modelling. In total, 31 diamond drill holes were completed totaling 20,802.7 m. Of these holes, 18 drill holes (13,269.6 m) were completed using NQ-size drill core and the remaining 13 drill holes (7,533.1 m) were completed using HQ-size drill core.

10.4.8 2015 Metallurgical Drill Program

In February and March of 2015, 11 HQ-size diamond drill holes totaling 4,178.8 m were completed within the proposed Ajax pit area. These drill holes were spread throughout the proposed Ajax pit to collect representative ore types for metallurgical testing.

10.4.9 2015 In-Pit Exploration Program

In April and May of 2015, KAM completed nine HQ-size diamond drill holes totaling 4,823.6 m within the Ajax pit area to expand upon results from the 2014 In-Pit Program. This program targeted the northeast extension area and the central part of the Ajax deposit (Saddle Area).

In September and October of 2015, KAM completed an additional four NQ-size diamond drill holes totaling 2,129.1 m in the northeast extension area to expand upon the earlier 2015 northeast extension drilling and to test IP anomalies to the north and east of this area.

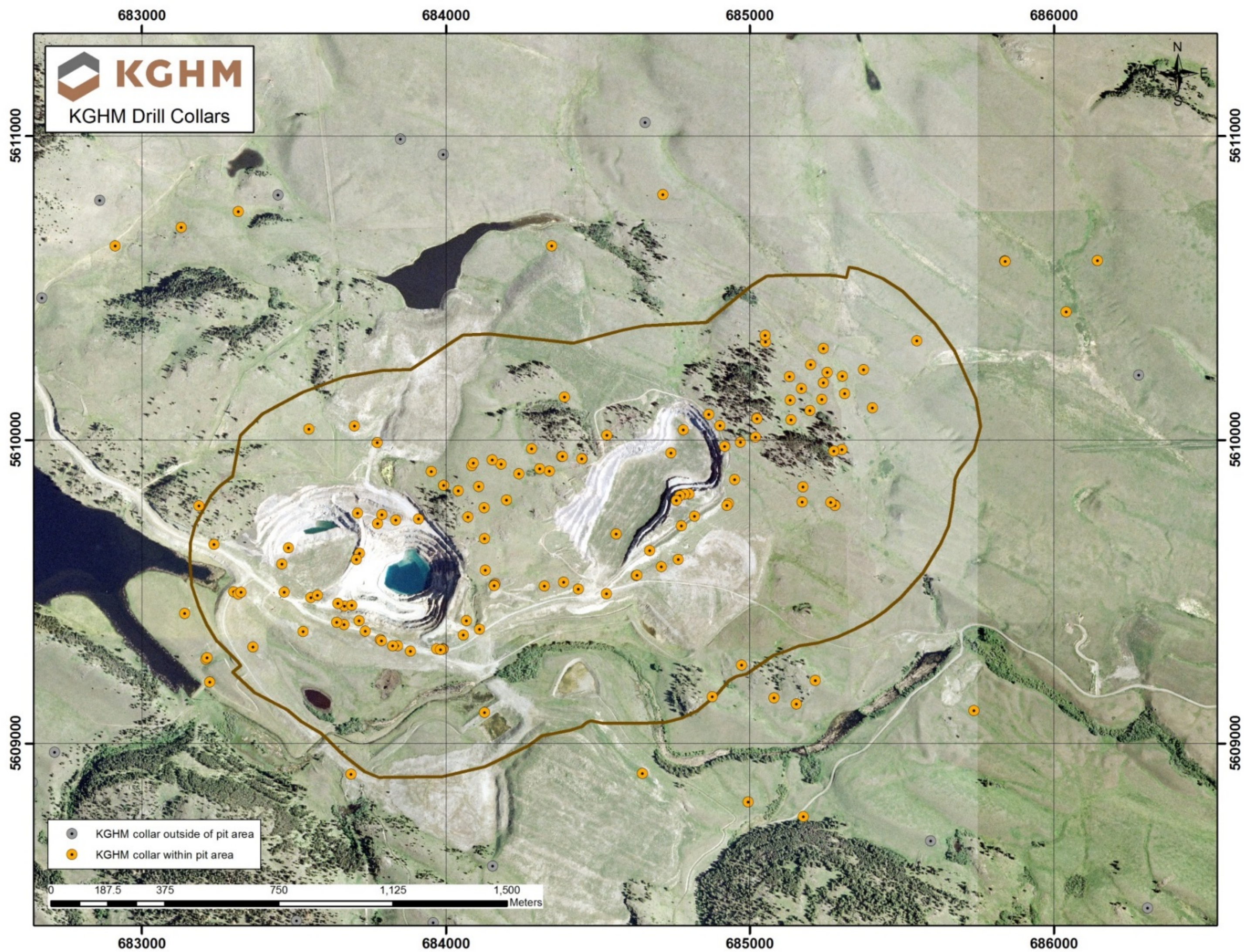


Figure 10-2: KGHM Collar Locations within Ajax Pit Area

10.5 KAM Drill Campaigns Outside the Ajax Deposit (2012 to August 2015, KAX-Series)

Between 2012 and 2015, KAM completed significant drilling in the area surrounding the Ajax deposit. These programs consisted of exploration drilling for economic mineralization (see Section 9, Exploration), condemnation drilling in areas of proposed infrastructure, and geotechnical drilling to support infrastructure design. Core from all non-exploration programs was evaluated by KAM geological staff for economic potential. Refer to Figure 10-3 for locations of drill holes completed outside the Ajax area.

10.6 KAM Drilling Procedures

All KAM drilling was completed with diamond drilling methods, utilizing either NQ- or HQ-size drill cores and generally using a 10 ft (3.05 m) core barrel. Several programs were completed using metric drilling rods and a 3 m core barrel. Occasionally, where ground conditions dictated, a triple tube drilling technique was used to enhance core recovery. All geotechnical programs used triple tube core barrels, pump out tools and ACT II core orientation tool.

Drill hole collars are marked in the field with a wooden post placed in the drill hole. An aluminum tag is attached to the post, identifying the drill hole. The collars are surveyed with Differential GPS (DGPS).

All cores from KAM programs are placed in wooden core boxes and stored in covered core racks at the secure KAM Site office.

Average recovery for the KAX- series of holes is 98.6%.

10.6.1 Geological Logging

The core logging facilities at KAM consist of all-weather core logging and cutting buildings located at the KAM Site office near the Ajax Project.

KAM has developed a core logging procedures manual and reference core libraries to ensure consistent collection of data across all drill programs and by all staff working on the various projects.

Once KAM became operator of the project, Abacus data was re-entered into CAE Mining's Fusion software, to allow KAM geologists to store and manage all drill hole data. Core from all subsequent drill programs was geologically logged directly into the Fusion drill hole database. All drill core was photographed both wet and dry prior to being cut for geochemical analysis.

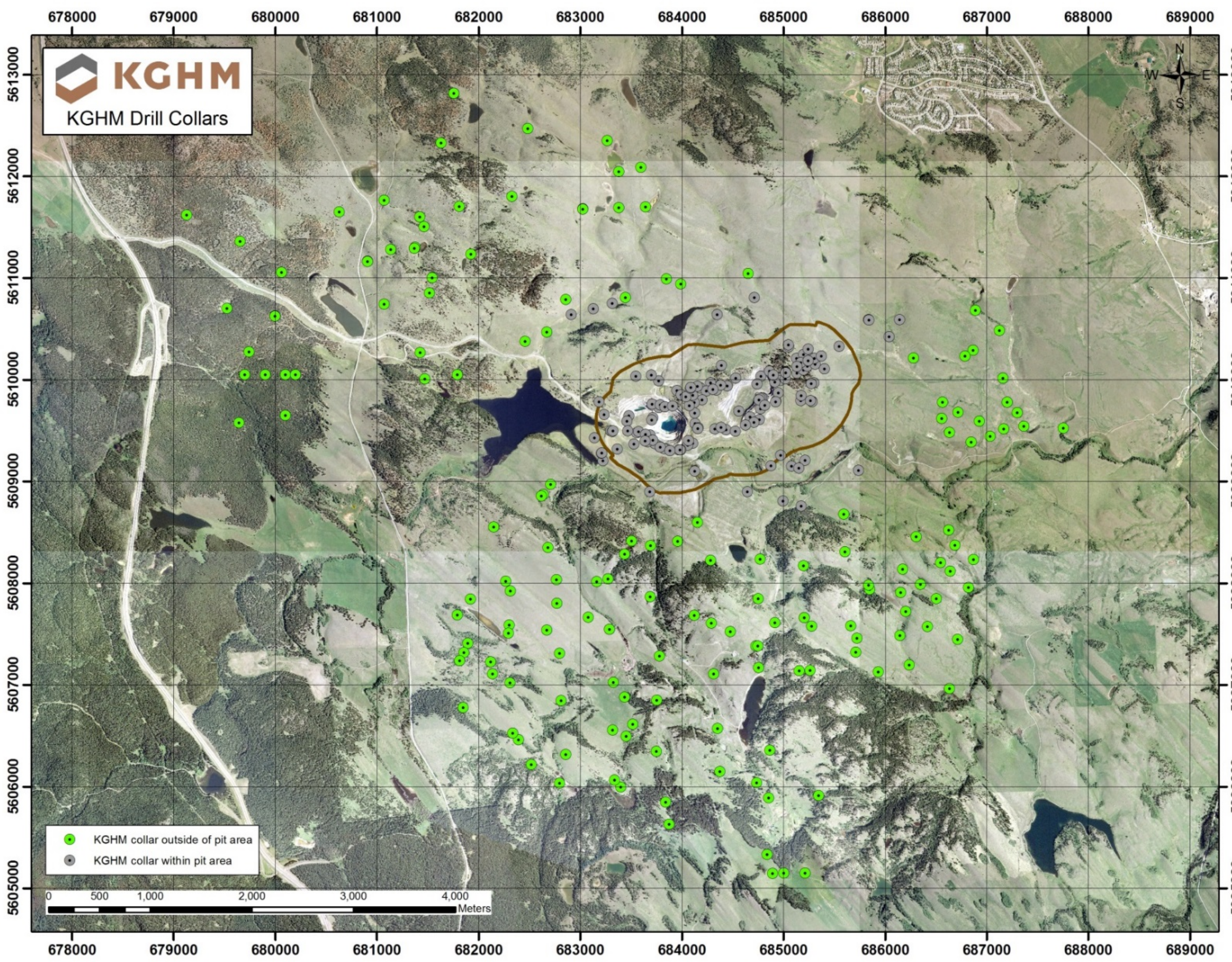


Figure 10-3: KGHM Collar Location Outside of Ajax Pit Area

10.6.2 Geotechnical Logging

KAM has transferred all of the Abacus geotechnical data into the Fusion database. Subsequent geotechnical logging was conducted and consisted of rock quality designation (RQD) determination, core recovery, and other rock mass rating parameters including number of joints, weathering, rock hardness, and joint angle. The geotechnical information was recorded on a separate logging form, entered into a computer spreadsheet and then regularly imported into the Fusion drill hole database.

During geotechnical logging, KAM technicians also collect point load strength data, spaced approximately every 10 m down hole as well as magnetic susceptibility readings at each interval block in the hole. This data is collected on separate logging sheets, entered into a computer spreadsheet and regularly imported into the Fusion drill hole database.

10.6.3 Drill Collar Surveys

Collar locations for all KAM drill holes are surveyed by KAM staff after drilling is completed, using a Trimble 5700 Differential GPS system. Surveyed coordinates are compared to proposed coordinates to check for errors in the survey data and to ensure holes are in the correct locations.

10.6.4 Down Hole Surveys

KAM requires all drill contractors to supply and operate suitable down hole survey equipment for all drill programs. With the exception of the 2014 in-pit program, all contractors have been utilizing the Reflex Ez-Trac downhole survey tool. The contractor that completed the 2014 in-pit holes used a Ranger Explorer Mk.II.

The procedure for downhole surveys of all KAM drill holes is to complete single shot surveys every 300 ft (90 m with metric rods) as the hole is being drilled. These single shot surveys are recorded on paper tags and delivered to KAM geologists daily, or as they are completed. The single shot surveys are used to track the hole as it is being drilled and as backup in case of failure in the multi-shot survey. After a hole is completed, the multi-shot survey is conducted as the drill rods are removed from the hole. Measurements are recorded every 100 ft (30 m with metric rods) as the rods are pulled. After the survey is complete, KAM geologists download the data from the controller, check for erroneous readings and import the survey data into the Fusion database.

10.7 Drilling Results

The Ajax deposit has been sampled at a drill hole spacing that is appropriate for a property at this level of development. The approximate drill hole spacing is 50 m in areas of mineralization. Spacing increases somewhat at depth and at the margins of the defined mineralization. Mineralized intervals, averaging more than 0.10% Cu, commonly range between 100 to 300 m in length. High-grade intercepts (greater than 1.00% Cu) are commonly less than 30 m in length and appear to be structurally controlled. Drilling in 2014 and 2015 was successful in expanding the mineralized zone within the central portion (Saddle Zone) and the northeast extension of the Ajax deposit.

11 Sample Preparation, Analyses and Security

11.1 Sampling Method & Approach

11.1.1 Introduction

The following discussion applies to sampling methods in the KAM and Abacus drilling programs, which represent approximately 74% of the drilling carried out on the Ajax property to date. The information available regarding drilling and sampling protocols used by Cominco and Afton OC in their earlier programs is limited.

11.1.2 Diamond Drilling Core Sampling

Core is placed in wooden core boxes at the drill site with the core run footage marked on wooden blocks and placed within the core, and the drill hole name and box number marked on the outside of the box. At each shift change, the drillers transport the full core boxes from the drill site to the core logging facility at the Ajax site office near Kamloops. A geological technician converts the footage blocks to metres, and labels the core boxes with the depth from and depth to, measures the core recovery and Rock Quality Designation (RQD), and tests the magnetic susceptibility and rock strength (point load).

Geological core logging is digitally recorded using Datamine's Fusion DH Logger® software. At the end of each day, or after a drill hole is completed, the data are uploaded to the Central database. The system allows a duplicate copy of the log to be stored separately, while ensuring that only one of these copies remains editable.

For HQ core, the preferred sample length is 2 m and for NQ core, the preferred sample length is 3 m; in each case, this was also the maximum sample length. Sampling honours geological contacts where appropriate, contacts with strong to intense albite alteration, and obvious high-grade mineralization. The minimum specified sample interval is 0.5 m. Sample intervals are noted in the geological log and recorded in a sample book that includes bar codes and triplicate tags. One tag portion is detached and placed in the core box underneath the core, near the beginning of the sample interval, for later placement in the sample bag when cutting is complete. The second tag portion is detached and stapled to the core box at the beginning of the sample interval. The third tag portion remains in the sample book as a permanent record.

After the core logging is completed and the sample intervals are marked out, the geologist takes both wet and dry photos of the core, typically three boxes at a time. The core photos are downloaded from the camera to a notebook computer and copied to the server located in the geology office.

The core is then moved to the sample processing area for cutting with diamond-studded saw blades. NQ core is sawn in half and one-half of the core is placed in a clear plastic bag marked with the sample number; the corresponding sample tag is placed in the bag and closed with a zap strap. The remaining half-core is returned to the core box. HQ core is sawn in half and then one-half of the core was sawn into quarters. The quarter core is placed in a clear plastic bag marked with the sample number, and the corresponding sample tag is placed in the bag and closed with a zap strap. The remaining three-quarter core is returned to the core box.

11.1.3 Sampling of Historic Percussion & Diamond Drill Holes

There is no information regarding the sampling method for the J-, NM- and WT- series of percussion holes or the DDH- diamond drill holes conducted by Cominco. Sample intervals were 10 ft (3.04 m). There is also no information on the sampling method for the TCK- series of diamond drill holes. Sample intervals were 3.0 m. None of the historic percussion drill holes are used in the KAM updated block model.

11.2 Sample Preparation, Analysis & Security

Discussion of sample preparation, assay procedures, assay quality assurance/quality control (QA/QC) results and security is divided into sections by drill campaign. The discussion below focuses on copper, gold and silver assays. Palladium and platinum were analyzed for certain drill campaigns, but are not considered relevant to the mineral resource at Ajax.

11.2.1 Cominco Sampling

There is no information regarding the sampling preparation for the DDH- diamond drill holes or the J-, NM- and WT-series of percussion drill holes conducted by Cominco. Sample intervals were typically10 ft (3.04 m).

11.2.2 Afton Operating Corp. Sampling

Samples for the TCK-, AW95- and AW96-series of diamond drill holes were analyzed at the Afton mine laboratory. No information is available regarding sample preparation for drill holes completed by Afton drill campaigns. Sample intervals were 3.0 m.

11.2.3 New Gold Sampling

New Gold Inc. (DRC Resources prior to 2005) employed Eco Tech Laboratories Ltd. (Eco Tech), now an ALS Minerals sample preparation facility, in Kamloops, B.C. for sample preparation and analysis of their 2004 and 2006 drill campaigns at the Ajax Project. In their 2004 Assessment Report, DRC Resources described the sampling procedures as follows:

> *All samples are sorted, documented, dried (if necessary), roll crushed to -10 mesh, split into 250 gram aliquots, and pulverized to 95% -140 mesh. Gold and palladium are assayed in 30 gram samples with conventional fire assay using A.A. and/or ICP Finish. Minimum reported detection for gold and palladium is 0.005 g/t. Copper is determined by Aqua Regia Digestion and A.A. Finish. "Metallic" copper (when required) includes two copper assays per sample. Silver geochemical analysis is by Aqua Regia digestion and A.A. Finish. All equipment is flushed with barren material and blasted with compressed air between each sampling procedure*.

In their NI 43-101 reported dated March 23, 2015, New Gold described their sampling procedures for the period of 2005-2011 as follows:

> *All analytical work was also performed by Eco Tech. Copper and silver assays were determined using standard acid digestion followed by AA. Gold and palladium were determined using fire assay followed by an AA finish. Pulps for one in five samples were run by ICP for deleterious elements, which included arsenic, antimony, and mercury. Internal checks consist of a minimum two repeats, one blank, two re-splits, and two or three reference standards, one for copper, one for silver, or one combined*

copper/silver and one for gold/palladium. If native copper was reported on the sample sheets, a metallic screen analysis was run in addition to the regular assay.

11.2.4 Abacus Sampling

Abacus employed Eco Tech Laboratories Ltd. (Eco Tech) in Kamloops, B.C. for sample preparation and analysis. The Eco Tech sample protocol remained relatively unchanged throughout the Abacus drill campaigns. Sample preparation was the same for gold, copper and silver analysis.

Samples with a minimum sample size of 250 g were catalogued and logged into the sample tracking database. During the login process, samples were checked for spillage and general sample integrity and verified against the sample shipment requisition provided by the client. Samples were then assigned an Eco Tech number, which was cross-referenced to the existing sample number. If necessary, the samples were transferred into a drying oven and dried.

Rock samples were crushed on a Terminator jaw crusher to -10 mesh ensuring that 70% passed through a Tyler 10 mesh screen. Every 35 samples, a re-split was taken using a riffle splitter to be tested to ensure the homogeneity of the crushed material. A 250 g subsample of the crushed material was pulverized on a ring mill pulverizer ensuring that 95% passed through a -150 mesh screen. The subsample was homogenized by rolling and bagged in a pre-numbered bag. Barren gravel blank was prepared before each job in the sample prep, to be analyzed for trace contamination along with the processed samples. Every ten samples, a repeat sample was taken to ensure proper weighing and digestion.

Gold assays were performed by fire assay on a 30 g sample size using appropriate fluxes. The flux used was pre-mixed and purchased from Anachemia Science and contained Cookson Granular Litharge, which was silver and gold free. The flux ratio was 66% litharge, 24% sodium carbonate, 2.7% borax and 7.3% silica (the charges were adjusted based on the sample). Flux weight per fusion was 150 g. Purified silver nitrate or inquarts for the necessary silver addition was used for inquartation. The resultant dore bead was parted and then digested with nitric acid followed by hydrochloric acid solutions and then analyzed on an atomic absorption (AA) instrument (Perkin Elmer/Thermo S-Series AA instrument). Gold detection limit on AA was 0.03 to 100 g/t. Any gold samples greater than 100 g/t were run using a gravimetric analysis protocol. Internal lab standards and repeat/re-split samples (quality control components) accompanied the samples on the data sheet for quality control assessment.

Copper assays were performed on a 0.5 g sample that underwent an oxidizing digestion in 200 mL phosphoric flask with final solution in aqua regia solution. The digested solutions were made to volume with Reverse Osmosis water and allowed to settle. An aliquot of the sample was analyzed on a Perkin Elmer/Thermo S Series AA instrument (detection limit 0.01% AA). Instrument calibration was done by verified synthetic standards purchased through SCP Science. Standards used narrowly bracketed the absorbance value of the sample for maximum precision. Internal lab standards and repeat/re-split samples (quality control components), which underwent the same digestion procedure as the samples, accompanied the samples on the data sheet for quality control assessment.

Silver was initially analyzed using an inductively coupled plasma-atomic emission spectroscopy (ICP-AES) method. This method required dissolving a 0.5 g sample digested with a 3:1:2 chloride acid:nitric acid:water ($HCl:HNO_3:H_2O$) solution in a water bath at 95°C. The sample was then diluted to 10 mL with water. All solutions used during the digestion process contained indium, which acts as an internal standard for the ICP run. The sample was analyzed on an ICAP 6500 Radial ICP unit. Internal lab Certified Reference Material (CRM) was used to check the performance of the machine and to ensure that proper digestion occurred in the wet lab. Quality control samples were run along with the client samples to ensure no machine drift or instrumentation issues occurred during the run procedure. Repeat samples (every batch of 10 or less) and re-splits (every batch of 35 or less) were also run to ensure proper weighing and digestion occurred. Any check analyses were performed on a Thermo IRIS Intrepid II XSP ICP unit. Silver assays had a lower detection limit of 0.2 ppm and an upper detection limit of 30 ppm. A further 31 elements (33 including copper and silver) were analyzed using the ICP-AES method above.

Results were collated and printed along with accompanying quality control data (repeats, re-splits, and standards). Results were emailed and mailed to Abacus. Any of the base metal elements (silver, lead, zinc) that were over limit (more than 1.0%) were immediately run as an assay as per the copper assay protocol above. Molybdenum was run as an assay if it exceeded 500 ppm during the ICP-AES method.

11.2.5 KAM Sampling

KAM employed ALS Minerals and Activation Labs (Actlabs), both based in Kamloops, B.C., for sample preparation and analysis.

For the 2012-June 2014 and 2015 drill campaigns, ALS Minerals was the primary laboratory for KAM sample preparation and analysis. Sample preparation was conducted in the lab's facility in Kamloops, B.C. and then a split of the pulp sample was shipped to the lab in Vancouver, B.C. for analysis. Sample preparation was the same for copper, silver and gold analysis.

All samples received at ALS Minerals were furnished with a bar code label attached to the original sample bag. The label was scanned and the weight of the sample was recorded together with additional information such as date, time, equipment used and operator name. A confirmation of shipping, including submittal form number, number of samples and waybill number was emailed from the sample preparation laboratory to the KAM QA/QC geologist.

The entire sample was dried and then crushing was done by a two-stage Terminator crusher. Crushing was done to better than 70% passing a Tyler 10 mesh (2 mm) screen (CRU-31). A split of up to 250 g was taken and pulverized to better than 85% passing a Tyler 200 (75 µm) mesh screen (PUL-31). The sample was then pulverized using an LM2 Pulverizing Mill with a small bowl.

Gold assays were performed by fire assay on a 30 g sample and analyzed via AA (Au-AA23). The lower detection limit for gold was 0.005 g/t and the upper detection limit was 10 g/t. Copper assays were performed on a 0.25 g sample which underwent four acid digestion to test for the presence of either 33 elements (ME-ICP61) or 48 elements (ME-MS61). The MS61 analysis was used primarily for metallurgical samples, due to the lower detection limits available for elements of interest such as arsenic and silver. The lower detection limit for copper with the ICP61 method was 0.0001% and the upper detection limit was 10%. The lower detection limit for copper with the MS61 method was 0.00002% and the upper detection limit was 1%. For assay results that were above the upper detection limit (>1% copper), ore grade ICP-AES with four-acid digestion was performed (ME-OG62). The lower detection limit for copper with this analysis was 0.001%.

For the July-December 2014 drill campaigns, ALS Minerals continued as the primary lab for the analysis of condemnation core samples, while Actlabs became the primary lab for the analysis of both In-Pit (Ajax) and Ex-Pit (Coquihalla, Rainbow, DM Audra) exploration core samples.

At Actlabs, sample preparation and analysis were conducted in the lab's facility in Kamloops, B.C. Sample preparation was the same for copper, silver and gold analysis.

All samples received at Actlabs were scanned and logged into the Laboratory Information Management Systems (LIMS). The sample bags were sorted in chronological order, weighed and dried at 40°C in a high air volume drying room. Following drying, samples were re-weighed prior to crushing and pulverization. A confirmation of shipping, including date and time of receipt, number of samples and certificate reference number was emailed from the sample preparation laboratory to the KAM QA/QC Geologist.

The entire sample was dried and crushed using a Rocklabs Boyd crusher. The crusher was cleaned with compressed air after each sample was crushed. After each mineralized sample, river rock was passed through the crusher to ensure any mineral residue from the mineralized sample was removed. The crushed rock was poured directly from the crusher pan into the appropriate size splitter so that there was no spillage of sample. If the sample was large and needed to be poured directly into a bag, a funnel with stand was used to eliminate spillage. The sample was then split mechanically using the riffle splitter until one fraction was able to adequately fill the pulverizer bowl. When using the riffle splitter, the sample was evenly distributed for all splitter shoots at the same time, otherwise splitting would be compromised. The crusher and splitter were vacuumed and cleaned with compressed air between each sample. The samples were crushed to at least 90% passing a 10 mesh screen.

A split of up to 250 g was taken and pulverized to 95% passing a 75 µm mesh screen (RX1) using a Labtech Essa LM2-pulverizer. All pulverizers were equipped with mild steel bowls for minimal contamination, other than Fe. Pulverizing time was adjusted, depending on the nature of the sample. Cleaner sand was used between every sample for cleaning of bowls.

Gold assays were performed by fire assay on a 30 g subsample and analyzed by AA (Au-1A2). The lower detection limit for gold was 0.005 g/t and the upper detection limit was 5 g/t. Copper assays were performed on a 0.25 g sample, which underwent four-acid digestion to test for the presence of 58 elements (UT4 TD-MS). The lower detection limit with this method was 0.00002% copper and the upper detection limit was 1%. For assay results that were above the upper detection limit (>1% copper), four-acid digestion was performed and then analyzed with ICP-MS (8 – 4 Acid ICP-MS). The lower detection limit for this analysis was 0.001% copper.

11.2.6 Quality Assurance/ Quality Control

KAM utilizes a program that consists of inserting CRMs and blanks into the sample stream at a rate of one CRM for every 20 samples tags and one blank for every 50 sample tags, to maintain an insertion rate of 5% CRMs and 2% blanks. CRM samples are obtained from CDN Resource Laboratories Ltd. in Langley, B.C. and blank material is obtained from ALS laboratory in Kamloops, B.C., which consists of crushed granite from Imasco Minerals Inc. in Creston, B.C. As assays results are received, the results for CRMs and blanks are plotted on graphs and checked to make sure they fall within acceptable limits. Lab re-splits and repeats are also checked for precision. Results from these accuracy and precision analyses are incorporated into QA/QC reports.

Following a drill program, or every month for larger drill campaigns, KAM submits 5% of the master pulps to a secondary lab for check assay purposes. Prior to 2015, either ALS Minerals or Actlabs was the secondary lab. In 2015, SGS in Burnaby, B.C. was used as the secondary lab. Results from these analyses are statistically verified and incorporated into check assay reports. The check assay results have generally performed well, typically within 5% relative percent difference (RPD) for copper and 10% RPD for gold at values greater than ten times the lower detection limit. There was one sample switch noted in the check assays for July to August 2014, which was corrected in the database.

11.2.7 Security

The Ajax Project facility and core storage areas are barbed wired and fenced and have video surveillance. Metal gates to the facility were locked when the area was not occupied. The facility contains permanent and temporary structures for offices, core logging, core cutting, lunchroom, core storage, and warehouse.

Core was collected at the drill site each day and transported to the Ajax Project facility by drilling personnel. Core samples were picked up by the lab on a regular basis for processing. Core samples awaiting shipment to the assay lab were stored in secured areas until they were shipped. Remaining cut core was placed in permanent storage in covered core racks. Pulps and rejects were returned from the lab and stored in locked Sea-Can containers in the storage yard at the project site.

Sample collection, sample preparation, security, and analytical procedures are in line with industry standards for this type and scale of mineral deposit. Formal QA/QC protocols are strictly followed and appropriate to ensure a high level of confidence in the sample collection and analysis procedures.

12 Data Verification

12.1 Assay Quality Control – Cominco (1980-1981)

There is no information regarding the quality control methods for the historic Cominco J-, NM- and WT- percussion drill holes or the DDH- diamond drill holes. No percussion drill hole data were used in the 2015 block model.

12.2 Assay Quality Control – Afton Operating Corp. (1987-1990, 1995-1996)

There is no information regarding the quality control methods for the historic Afton Operating TCK-, AW95- and AW96- diamond drill holes.

12.3 Assay Quality Control – New Gold (2004 & 2006)

New Gold Inc. (DRC Resources Corporation, prior to 2005) conducted two diamond drill campaigns in the Ajax area, in 2004 and 2006. An Assessment Report dated September 1, 2004 stated that “assay standards are routinely used” and “pulp samples are randomly selected for duplicate assaying by different laboratories.” According to the New Gold NI 43-101 report dated March 23, 2015, from 2005-2006 a blank, standard or duplicate was entered into the sample stream at a frequency of one every eight samples.

12.4 Assay Quality Control – Abacus (2005-2011)

Abacus Mining and Exploration Ltd. was the project operator at Ajax from 2005-2011. From 2005 to 2008, standards and blanks were inserted into the sample stream at a rate of 1 standard every 35 samples and 1 blank every 35 samples, for an overall insertion rate of 5.7%. From 2009 to 2011, samples and blanks were inserted into the sample stream at a rate of 1 standard every 20 samples and 1 blank every 20 samples, for an overall insertion rate of 10%. Pulp duplicates were selected at random at a rate of 5% and submitted to ALS in Vancouver for check assay.

12.5 Assay Quality Control – KAM (2012-Present)

Insertion of standards and blanks was changed to 1 standard every 20 samples and 1 blank every 50 samples, for an overall insertion rate of 7%. Check assays were selected randomly, at a rate of 5%, and sent to a secondary laboratory upon completion of each drill program or bimonthly, depending on the quantity of samples originally assayed. Between 2012 and mid-2014, ALS Minerals was the primary assay laboratory and Actlabs was the secondary laboratory. In the latter half of 2014, ALS Minerals was the primary laboratory for the condemnation drill program and Actlabs was the primary assay laboratory for the in-pit drilling program. Conversely, check assays for the condemnation drilling were sent to Actlabs and check assays for the in-pit drilling were sent to ALS. In 2015, ALS Minerals was the primary assay laboratory and check assays were sent to SGS as the secondary laboratory. QA/QC and check assay reports were completed for all of the results.

12.6 AMEC Data Verification

AMEC completed audits of the Ajax drill hole database in 2008-2009, 2010 and 2011.

The 2008-2009 database review consisted of manually comparing original log, collar and down-hole survey information against data contained in the database for four drill holes (AM-09-024, AM-09-034, AM-10-040 and AM-10-053). The data verified included collar survey, down hole survey, geology tables, sample intervals, and sample numbers. The assay data were electronically verified for 100% of the new drilling information. One drill hole was corrected from the proposed coordinates to the final surveyed coordinates. To assess downhole surveys, AMEC utilized "Kinkchk" deviation checking software. All surveys were accepted. No discrepancies were noted in the assay tables.

In 2010, the database review consisted of drill holes AE-10-064 through AE-10-099, AM-10-054 through AM-10-086, AN-10-75 through AN-10-081, and AW-10-105 through AW-10-125. The collar surveys, down hole surveys, geology tables, sample intervals, and sample numbers were verified. The assay and ICP data was electronically verified for 100% of the new drilling data. No serious errors were noted in the collar table. Eight minor numerical errors were discovered in the downhole survey table, which were promptly corrected. All surveys were accepted for estimation purposes. No differences were noted between lithology intervals in the database and the original paper logs. No discrepancies were noted between sample intervals and sample numbers in the database compared to the original paper logs.

In 2011 AMEC conducted a QA/QC review on the Ajax database. AMEC reviewed data from three Certified Reference Materials (CRMs), pulps duplicates, blanks and check assays. AMEC did not note any significant biases indicated by the CRM results. All biases were below 5%. AMEC found the pulp duplicate results acceptable for gold, but recommended that sample preparation procedures for copper be reviewed for possible improved precision in the future through finer crushing, better blending and/or splitting of the sample, and splitting of a larger sub-sample for pulverization. Blank data was considered acceptable, with occasional but immaterial contamination for gold noted. Check assays for gold were determined to be unbiased between the original Eco Tech and the secondary ALS Chemex results. Copper check assays were found to be 2% lower at Eco Tech, however a bias of ±5% was considered acceptable and the ALS Chemex results were considered to confirm the Eco Tech results.

The AMEC QPs concluded that a reasonable level of verification had been completed during the audits, and that no material issues would have been left unidentified from the programs undertaken. In the opinion of the AMEC QPs, the data verification programs undertaken on the data collected from the project adequately supported the geological interpretations, the analytical and database quality, and therefore supported the use of the data in Mineral Resource and Mineral Reserve estimation. However, a confidence restriction was applied to legacy data (pre-2005 drilling).

12.7 KAM Data Verification

In 2013, KAM completed a QC review of the Abacus CRMs, lab repeats, lab re-splits and check assays in a report titled "Ajax-Abacus QC Review" and found the results to be reasonable:

> *Overall, QC analysis of the Abacus drilling yields very reasonable results. The standards performed well, with a failure rate of 1.04%, which is acceptable, and there were no blank failures. PRE analysis for all standards was within the acceptable limits, and very close to 100% in most cases. The precision of duplicates, when divided into grade ranges, was reasonable, and there was good correlation of assay data to check assay results.*

There were a number of sample mix-ups, and suspected sample mix-ups, identified in the duplicate datasets. It is recommended that, going forward with the new drill campaigns, duplicate results be monitored much more closely so that suspected switches can be addressed and re-assayed where necessary on a monthly basis. It goes without saying that this is recommended for the standards and check assays as well, that they be monitored on a monthly basis. (N. Ceaser, 2013).

KAM completed data verification while the database was being transferred from Abacus' Lagger 3D software into Fusion. Collar, survey, lithology, mineralization, texture, alteration, structure and veining tables were imported from comma separated value format and checked for errors or omissions. Assay and ICP data were loaded from original digital certificates where available. Additional alteration and veining information was entered from paper logs to ensure complete capture of the data. Historic paper logs and certificates were added to the database and coordinates were confirmed.

12.8 MDA Data Verification

In 2014, Mine Development Associates (MDA) reviewed QA/QC evaluations relating to the Ajax Project, in a number of documents and partial documents that were provided to MDA in digital formats by KGHM. MDA did not do any new or original evaluations of the QA/QC data, and did not in fact have the data; the work was limited to reviews of the various evaluations done by others. The QA/QC evaluations that MDA reviewed were done either by AMEC, an independent consultancy, or by KGHM's own technical services group.

MDA concluded that both AMEC and KAM's QA/QC methods were valid, the work was done in a professional manner to an appropriate level of detail, and the conclusions expressed by AMEC and KGHM with respect to QA/QC data could be relied upon. The also concluded that the QA/QC data supported the use of the Ajax database in the resource estimates prepared by those respective organizations.

The author has directly supervised data collection at the project site since December 2013. Procedures include spot checks of geology data, sample layout and collection, assay results versus observation, and consistency with geological and resource modelling. Staff includes three experienced geologists, including a Professional Geologist. The data is deemed adequate for incorporation in resource modelling and mineral resource estimation.

12.9 Drill Database Management

KAM's Ajax Project uses Datamine's Fusion Geological Database Management Solution (Fusion GDMS) to collect and manage all of its borehole and related data. This system operates on a Microsoft SQL server platform using a relational database as its central repository. The Fusion GDMS uses a check-in and check-out technology to ensure information integrity and allow data entry/editing in a local environment (Sybase ASA). The Fusion GDMS SQL server database, called the Central database, resides at KGHM's corporate data centre in Toronto where it is managed by an IT outsourcing contractor (Cogeco Data Services). The Central database is backed-up on a daily basis with incremental backups every hour. A full back up of the SQL server is performed monthly, which is archived to tape and stored offsite.

Before synchronizing data to the Central database, data are managed and controlled at the site level through a Fusion Remote database that is located on the server in the site geology office.

The Remote database allows faster check-in and check-out of drill hole data to local logging computers. The Remote database synchronizes to the Central database.

Drill hole data are logged digitally into a local Fusion GDMS database which is then checked into the Remote database. The Fusion GDMS system has rules in place for allowing overlapping intervals, and does not allow duplicate sample numbers. Once all the data are entered and the assays returned, the drill hole data are reviewed by the logging geologist and the project geologist before being authorized. Once a drill hole has been authorized, no edits can be made by geologists unless they follow the KGHM Change Management Policy. An edit to an authorized drill hole is initiated by a Change Request Form, which is then reviewed by the database administrator. Once approval has been received by a senior level geologist, the original data are backed up and archived for future reference; the change is performed within a test environment. The change must then be approved by the requestor before it can be promoted to the Remote and Central databases.

13 Mineral Processing and Metallurgical Testing

13.1 Introduction

The Ajax Project will mine and process 65,000 t/d of porphyritic chalcopyrite-bearing hornblende diorite material. Additional metallurgical work commenced in 2015, but was not used in the Basic Engineering design. Only the metal recovery results have been applied to the updated economic model.

13.2 Historical Testwork Programs

In July 2009, Wardrop completed a historical review as part of a PEA-level study. The testwork programs and reports are listed in Table 13-1.

Table 13-1: Historical Testwork Programs & Reports

Document or Test Program	Author/ Laboratory	Date
Mineral Resource Estimate for the Ajax West Deposit	Beacon Hill Consulting	May 2007
Metallurgical Testing on Samples from Ajax & DM-Audra Project, Report No. KM1929	G&T	May 2007
Summary Report on the 2007 and 2008 Abacus-New Gold Inc. Joint Venture Diamond Drill Program on the Ajax Property	Abacus	Sept 2008
Metallurgical Testing on Samples from Ajax & DM-Audra Project, Report No. KM2228	G&T	Oct 2008
NI 43-101 Technical Report on the Afton-Ajax E-W Deposit	AMEC	Oct 2008
Preliminary Metallurgical Data, G&T Excel Files – Test Program No. KM2350 (Molybdenum testing)	G&T	Feb 2009

Additional testwork was completed between 2009 and 2012 and is listed in Table 13-2.

Table 13-2: Subsequent Testwork Programs & Reports

Document or Test Program	Author/ Laboratory	Date
Ajax Copper/Gold Project, Kamloops, British Columbia – Preliminary Assessment Technical Report. Doc. No.0854610100-REP-R0001-02	Wardrop	July 2009
Prefeasibility Metallurgical Testing, Abacus Mining Exploration Corp., Ajax Project. Report No. KM2435	G&T	Oct 2009
Ajax Copper/Gold Project, HPGR Energy Study, Doc. No.1054610100-REP-R0001-01	Wardrop	Feb 2010
High Pressure Grinding and Ball Mill Grindability Tests on Copper Gold Ore from the Ajax Project in British Columbia, Canada. Project No: 2337 4191	Krupp Polysius Research Centre	Oct 2010
Feasibility Metallurgical Testing, Ajax Project. Report No. KM2688	G&T	Nov 2010
Memorandum – Grade Recovery	L. Duncan to A. de Ruijter, Wardrop	Jan 2011
Additional Flotation Testing, Ajax Feasibility Study, Abacus Mining & Exploration Corp. Report No. KM2905	G&T	Feb 2011

Metallurgical test programs were completed by KAM in 2013 and 2014. Data from these test programs were used as the basis for this updated technical report.

The 2013 Metallurgical test program resulted in the report “Metallurgical Assessment on the Ajax Property Samples - Focus on Years 1-5 (KM3889- RPT-000001), ALS, December 2013”.

The 2014 Metallurgical test program resulted in the report “KGHM Final Report - Focus on Years 6+ (RPT-000308), Dawson Labs, December 2014”. The report is summarized in “KGHM Final Presentation - Focus on Years 6+ (KA39-FLSDML-PRE-000001), Dawson Labs, December 2014”.

The 2015 Metallurgical test program resulted in the report “Metallurgical Testing of the Ajax Deposit – 2015 (KA39-KGHM-RPT-001031), ALS Metallurgy, November 2015”.

13.3 2013 Metallurgical Test Program

The objective of the 2013 metallurgical test program was to build on previous testing and to support a detailed engineering study by providing data to update processing design criteria. The samples used for the metallurgical tests were comprised of full, half and quarter drill core samples from the Ajax Property. ALS Metallurgy (formerly G&T Metallurgy) performed all of the metallurgical testing.

The scope of the test program was subdivided into the following activities:

1. Defining 14 (13 plus one “miscellaneous”) metallurgical geological unit composites:
   - Conduct chemical analyses on all geological unit composite samples
   - Perform a series of ore hardness tests on comminution geological unit composites
   - Conduct standard batch rougher and open circuit cleaner flotation tests on each metallurgical geological unit composite.
2. Use two master composites formed from metallurgical geological unit samples:
   - Perform mineralogical analyses by QEMSCAN Particle Mineral Analysis (PMA) to determine mineral content/associations, deportment and liberation characteristics
   - Conduct standard bench rougher and open circuit cleaner flotation tests on each master composite
   - Conduct locked cycle flotation testwork on metallurgical master composites.
3. Use 25 composite samples for comminution testing
4. Pilot plant testing (five feed composites and two commissioning samples):
   - Conduct standard bench rougher and open circuit cleaner flotation tests on each composite
   - Assess the response of each feed composites to the flowsheet developed in the laboratory
   - Produce concentrates and tailings for dewatering testwork.
5. Determine the concentration of various deleterious elements that might affect marketability of the copper concentrates produced.

Comminution testwork results indicated that the Ajax material ranged from moderately hard to very hard relative to Bond ball and rod mill work indices and SMC and drop weight tests. Abrasion test results categorized the samples as mildly abrasive.

Between 86% and 89% of the copper in the master composites was recovered in locked cycle tests, to a copper concentrate grading between 27% and 32% copper. Gold in the feed was between 83% and 92% recovered to the copper concentrate grading between 14 and 28 g/t gold.

13.4 2014 Metallurgical Testing

The purpose of the 2014 metallurgical testing program was to:

- Produce data to refine the Ajax grinding, flotation, and dewatering flow sheets
- Validate previously determined process design information.

Geological review of the geological units (geo-units) used for mine modelling resulted in a reduction from 14 geo-units (from 2013 program) to six geo-units as described in Table 13-3. Included with the descriptions in the table are the weighted distributions of the six geo-units within the mine model. Testing was performed on six individual geo-unit composites, as well as potential ore blends identified to be processed in Years 6 to the end of mine production. Table 13-3 shows how the 2013 geo-units were combined into six geo-units for 2014.

Dawson Metallurgical Laboratories (DML) of FLSmidth conducted metallurgical testing in 2014. The scope of the test program was subdivided into the following activities and objectives:

- Confirm metallurgical performance of the flotation conditions and reagent suites to meet design recovery and concentrate grades.
- Optimize the percent solids and pH for flotation.
- Determine the incremental gold recovery by gravity concentration in the grinding and/or flotation circuit.
- Determine the optimum regrind sizes for the cleaner circuit.
- Determine concentration levels of deleterious metals in the Cu concentrate.
- Determine comminution and metallurgical performance variability for each geo-unit composite.
- Perform confirmatory locked cycle tests for metal recoveries.
- A series of smaller sized tests for individual geo-unit composites for recovery data to apply to the mine block model.
- A series of larger sized tests to assess blending impacts to recovery, concentrate grade and generate dewatering test feed samples.
- Perform confirmatory thickening and filtration tests for tailings and copper concentrate.
- Perform Bulk Modal Mineralogical evaluations on geo-unit composite samples.

Reagent performance, regrind sizes, and flotation conditions optimization were performed through a series of bench flotation testing. Evaluation of the incremental benefit for a gravity gold circuit was performed through gravity recoverable gold testing (E-GRG), with the results applied to FLSmidth-Knelson's computer modelling. The model optimized the number of Knelson concentrators and location in the flowsheet to provide the maximum benefit/value.

Table 13-3: 2013 and 2014 Geo-Unit Composites (GUCs)

2014 Comp. No.	Composite Name	Composite Description	2013 Component Geounits	Component Geounit Name	% Distr.
1	SLDE – Sugarloaf Diorite East	Same lithologic unit only with varying intensity of albite alteration. All 3 are in the East Pit area.	9. East SLD, weak or absent albitization *Sugar Loaf Diorite*	E-SLD-w	64.8%
			10. East SLD, moderate albitization *Sugar Loaf Diorite*	E-SLD-m	
			11. East SLD, strong albitization *Sugar Loaf Diorite*	E-Sld-s	
2	SLDW - Sugarloaf Diorite West, mod to low albite	Same lithologic unit only with varying intensity of albite alteration. Both are in the West Pit area.	1. West SLD, weak or absent albitization *Sugar Loaf Diorite*	W-SLD-w	15.9%
			2. West SLD, moderate albitization *Sugar Loaf Diorite*	W-SLD-m	
3	SVHYB – Sugarloaf Volcanic Hybrid	Same lithologic unit only with varying intensity of albite alteration with 5-6 in the West Pit and 13 in the East.	5. West SVHYB, weak or absent albitization *Sugarloaf/Volcanic Hybrid*	W-SVHYB-w	8.8%
			6. West SVHYB, moderate albitization *Sugarloaf/Volcanic Hybrid*	W-SVHYB-m	
			13. East SVHYB *Sugarloaf/Volcanic Hybrid*	E-SVHYB	
4	MVP – Mafic Volcanic / Picrite	Similar lithologic units that are typically not well mineralized.	7. PICR (east and west) *Picrite*	PICR	4.5%
			8. West MAFV *Mafic Volcanic*	W-MAFV	
			12. East MAFV *Mafic Volcanic*	E-MAFV	
5	SLDW – Sugarloaf Diorite East		3. West SLD, strong albitization *Sugar Loaf Diorite*	W-SLD-s	3.2%
6	IMH - Iron Mask Hybrid			IMH	2.8%

Quantities of ore required for pilot plant testing were limited. KAM opted to have DML perform small locked cycle tests (14 kilograms each cycle, 5 cycles) and large locked cycle tests (50 kilograms each cycle, 6 cycles). The primary advantage for this approach was maximizing the quantity and quality of test data obtained, by reaching steady state conditions quickly. The series of small locked cycle test results for each geo-unit were used as the basis (along with 2013 metallurgical testing results) for the final metal recovery data used in the mine model.

13.4.1 Copper (Cu) and Gold (Au) Recovery Results

The results shown in Table 13-4 and Table 13-5 show the recoveries for the 2013 and 2014 metallurgical test programs. These combined and weighted Cu and Au recovery values (by geo-unit) from metallurgical testing were provided to the mine as input variables for the block model. The reserve estimate utilized the 2013/2014 metal recovery data (see Table 15-2).

Table 13-4: Total Copper Recoveries (%)

Geo-unit Composite	Years 1-5	Years 6+	
	2013	**2014**	**2013/2014**
1	87.2	86.5	86.7
2	87.6	90.1	89.5
3	79.8	82.9	82.2
4	85.5	78.5	80.2
5	80.1	86.4	84.9
6	86.2	86.3	86.3
Weighted Avg*	**86.2**	**86.4**	**86.4**

Note: *Average recovery based on the Nov. 2014 Mine Model results, with the average recoveries calculated using the relative mass percent of the GUCs.

Table 13-5: Total Gold Recoveries (%)

Geo-unit Composite	Years 1-5	Years 6+	
	2013	**2014**	**2013/2014***
1	89.5	84.3	87.3
2	84.0	85.2	84.9
3	77.6	82.2	82.9
4	87.9	70.9	76.8
5	73.7	80.9	81.0
6	85.8	86.4	88.1
Weighted Avg**	**86.9**	**83.5**	**85.9**

Note: *Includes +2.4% recovery from gravity circuit. **Average recovery based on the Nov. 2014 Mine Model results, with the average recoveries calculated using the relative mass percent of the GUCs.

13.4.2 Silver (Ag) Recovery Results

Silver recovery is calculated utilizing the 2013 pilot plant silver recovery of 75.6% for all GUCs

*Ag in Concentrate = Ag in Head*75.6%*

and a smelter return constraint of a minimum payable concentration of 30 g/T. On this basis, the ore Ag head grade of 0.419 g/T achieves a payable concentration level of 30 g/T in the Cu concentrate.

The 2014 metallurgical testing data were not used for the silver recovery calculation estimate due to lower Ag head grades. The lower Ag head grades were a result of targeting only Cu and Au LOM grades for metallurgical testing.

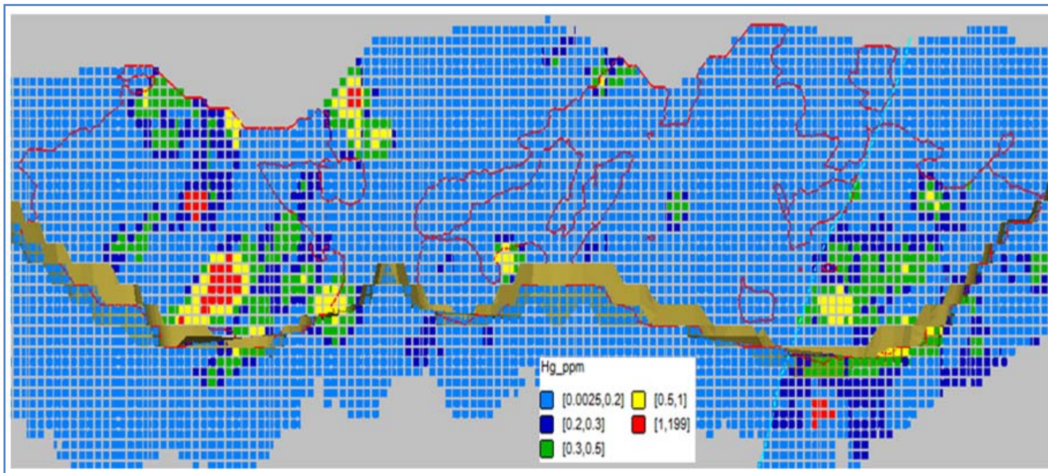
13.4.3 Mercury (Hg) Recovery Results

The 25 small locked cycle tests performed in 2014 produced Hg recovery data. The Hg head assays for the geo-unit composite samples varied widely, resulting in separate grade-recovery curves for Hg in final Cu concentrate by GUC as shown in Table 13-6.

Table 13-6: Hg Recovery Equations

GUC 1	Hg in Conc = Hg in Head*30.3
GUC 2	Hg in Conc = Hg in Head*46.9
GUC 3	Hg in Conc = Hg in Head*40.5
GUC 4	Hg in Conc = Hg in Head*42.1
GUC 5	Hg in Conc = Hg in Head*60.4
GUC 6	Hg in Conc = Hg in Head*97.4

The high Hg variability in each of the geo-units necessitated a need for 4,300 pulps (from existing drill core) to be sent out for Hg determinations. These assays were utilized to update the block model for estimation of mercury head grades. Mercury is not evenly distributed within the deposit, but occurs locally along specific structures. One section of the block model shows the Hg variability in Figure 13-1. A concentrate blending strategy is the intended strategy to reduce or eliminate potential penalties.



Longitudinal section looking north showing the distribution of mercury values estimated in the block model . Higher grades occur locally in the west area and east area at depth.

Figure 13-1: Hg in Block Model

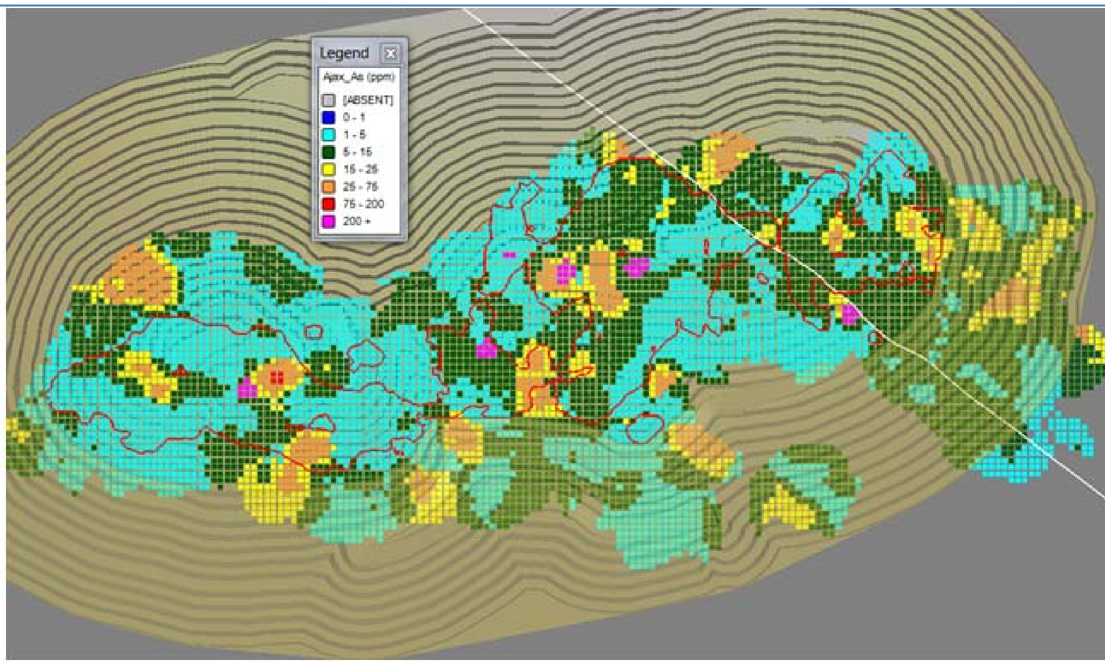
13.4.4 Arsenic (As) Recovery Results

The 25 small locked cycle tests performed in 2014 also produced As recovery data. Similar to Hg, the As head assays for the samples varied widely resulting in the need to generate separate grade-recovery curves of As into final Cu concentrate by GUC as shown in Table 13-7.

Table 13-7: As Recovery Equations

GUC 1	As in Conc. = As in Head*16.8
GUC 2	As in Conc. = As in Head*6.0
GUC 3	As in Conc. = As in Head*50.9
GUC 4	As in Conc. = As in Head*52.1
GUC 5	As in Conc. = As in Head*84.3
GUC 6	As in Conc. = As in Head*8.5

The same 4,300 pulps sent to the lab for Hg determination also were assayed for As content and included in the mine model. One view of the block model shows the As variability in Figure 13-2. When applied to the block model, there is no indication of significant penalties due to arsenic content in the final concentrate.



Plan view at 700rl showing Arsenic values in the Block Model. The higher grades are commonly localized. Red line is the outline of the ore zone.

Figure 13-2: As Block Model

13.4.5 Comminution Testing

Comminution tests conducted at FLSmidth included SMC Testing®, Bond's Ball Mill Work Index, Bond's Low Energy Crusher Work Index (CWi), Bond's Abrasion Index (Ai), and HPGR Sizing using FLSmidth's F150 test unit.

13.4.6 SMC Testing®

The SMC Test® returns Axb and Drop Weight Index (kWh/m³) values. This test is often part of ore body characterization and variability estimation programs as well as for SAG power requirements, SAG mill sizing, and HPGR sizing. Six SMC tests were conducted at FLSmidth with test data being sent to JKTech for analysis. The SMC Test results for samples B-1 to B-6 are summarized in Table 13-8. The results provided includes the derived estimates of parameters A, b, and t_a, as well as the simulation values for M_{ia}, M_{ih}, and M_{ic}.

Table 13-8: Summarized SMC Test® Results

	A	b	A x b		t_a	SG	DWi		M_{ia}	M_{ih}	M_{ic}
			Value	%			kWh/m³	%	kWh/mt	kWh/mt	kWh/mt
B-1	64.6	0.55	35.5	28.6	0.33	2.78	7.79	76	21.3	16.2	8.4
B-2	81.4	0.33	26.9	8.8	0.25	2.80	10.27	92	26.4	21.3	11.0
B-3	64.6	0.53	34.2	25.5	0.32	2.77	8.02	78	21.9	16.8	8.7
B-4	53.1	0.68	36.1	29.9	0.33	2.88	7.94	77	20.9	16.0	8.3
B-5	74.5	0.44	32.8	22.1	0.31	2.75	8.32	81	22.7	17.6	9.1
B-6	86.8	0.35	30.4	16.2	0.26	3.04	9.95	91	23.7	19.0	9.8

13.4.7 Bond's Ball Mill Work Index

The Bond Ball Mill Work Index (kWh/tonne) was used for ball mill power sizing, and for ore body characterization and variability estimation. Twelve Bond Ball Mill tests were performed, four of which were performed for QA/QC. Bond's Ball Mill Work Indices (BWi) ranged between 19.6 to 27.4 kWh/t for a closing size of 300 micron as displayed in Table 13-9.

Table 13-9: Initial BWi Results of B-1 through B-6 Samples

Sample	Closing Size [µm]	F_{80} [µm]	P_{80} [µm]	Grams per Revolution (Gbp)	Feed % Minus Closing Size	Bond Ball Mill Work Index (BWi) [kWh/tonne]	Work Done in Bond Ball Mill [kWh/tonne]
B-1	300	1929.6	224.6	1.29	21.2	24.4	10.7
	106	1830.7	79.0	0.89	12.2	20.7	18.5
B-2	300	1883.7	224.5	1.29	22.0	24.6	10.7
B-3	300	1914.2	224.7	1.33	22.4	23.8	10.4
B-4	300	1779.2	218.9	1.69	26.1	19.6	8.6
B-5	300	1860.6	235.0	1.18	21.3	27.4	11.5
	106	1971.1	78.2	0.82	11.4	21.8	19.7
B-6	300	1915.1	212.7	1.43	24.8	21.5	9.8

13.4.8 Bond's Low Energy Crusher Work Index (CWi)

The Bond Crusher Work Index (kWh/tonne) was used for estimating the crusher power. This test was performed on six samples each with 17-20 pieces tested which met Bond's ten-piece minimum sample requirement. The CWi values ranged from 2.9-6.9 kW-hr/tonne. The CWi results are presented in Table 13-10.

Table 13-10: Bond's Crusher Work Index Results for CWi/Ai Samples

Sample	CWi			
	No. of Pieces	[kWh/tonne]	Relative Density (SG)	Classification
A-1	18	4.3	2.80	Soft
A-3	19	5.0	2.84	Soft
B-1	20	4.1	2.83	Soft
B-3	17	2.9	2.73	Soft
B-4	20	5.9	2.85	Soft
Waste	20	6.9	2.79	Soft

13.4.9 Bond's Abrasion Index Results (Ai)

The Bond Abrasion Work Index (g) was used for metal consumable wear rate estimation. Bond's Abrasion Index test was performed on the remaining material from the CWi samples. The abrasion index (Ai) value ranged from 0.0694 g to 0.2292 g. The Ai results and classifications are presented in Table 13-11.

Table 13-11: Bond's Abrasion Work Index Results for CWi/Ai Samples

Sample	Ai	
	[grams]	Classification
A-1	0.1468	Soft
A-3	0.1364	Soft
B-1	0.2292	Medium
B-3	0.1060	Soft
B-4	0.0694	Very Soft
Waste	0.1578	Soft

13.4.10 HPGR Sizing

FLSmidth performed HPGR sizing tests with their pilot plant unit. Geo-unit 1 represents the majority of the ore body and was the only sample tested.

Figure 13-3 shows that processing the feed material through the HPGR changes the slope of the particle size distribution curve, which is a normal result from HPGR processing.

Test results (shown on Table 13-12) indicate that the specific press force affected the particle size distribution on a gradient as increasing the specific press force primarily affected the larger particle sizes. Results indicated that the specific energy increased with increasing specific press force and was not significantly different for the closed-circuit high moisture run compared to the low moisture open circuit runs. The specific power increase was about 10% higher for the high moisture open-circuit run.

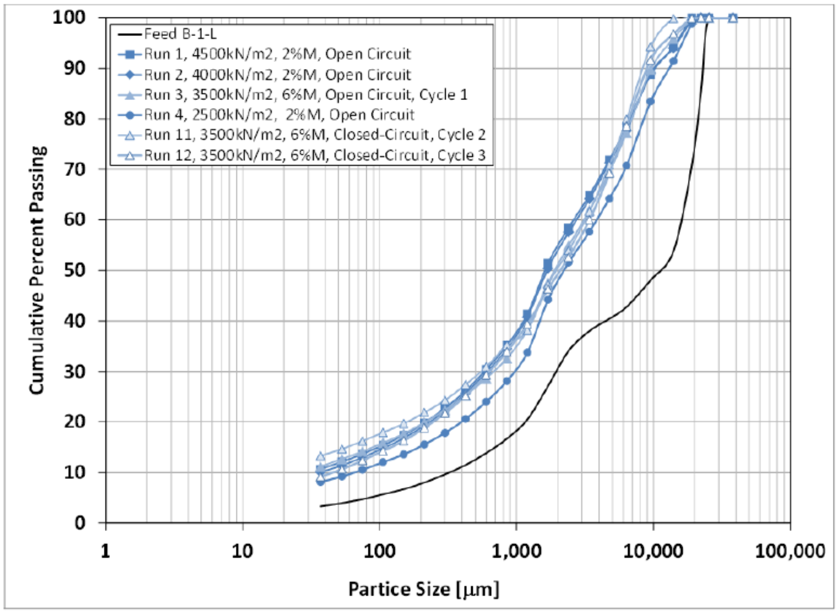


Figure 13-3: HPGR Feed and Product Particle Size Distributions

Table 13-12: HPGR Sizing Test Results

Value	Units	Drum A	Drum B	Drum C	Drum D	Drum B & E
Test Name	-	Initial-High	Initial-Medium	Initial-Low	High Moisture	Closed-Circuit
Roll Speed	m/s	0.5	0.5	0.5	0.5	0.5
Roll Diameter	m	0.5	0.5	0.5	0.5	0.5
Roll Width	m	0.3	0.3	0.3	0.3	0.3
Test Duration	seconds	49.0	43.0	46.0	47.0	42.0
Wet Total Feed Mass	kg	178.9	165.8	181.9	172.9	153.6
Percent Moisture	%	0.5	0.5	0.5	4.1†	3.0
Dry Total Feed Mass	kg	178.0	165.0	181.0	165.9	149.0
Recycle*	%	0	0	0	0	44
Total Power	kW	39.9	33.2	29.2	37.0	33.6
No-Load Power	kW	2.0	2.0	1.9	1.9	2.1
Net Power	kW	37.9	31.2	27.3	35.1	31.5
Pressure	bar	102.3	82.1	61.5	81.8	82.0
Gap	mm	11.0	12.1	13.2	9.2	9.8
Total Throughput	mt/hr	13.1	13.8	14.2	12.7	12.8
Specific Throughput	ts/hm^3	174.4	184.2	188.9	169.4	173.5
Specific Press Force	kN/m^2	4,976	3,989	2,992	3,979	3,985
Specific Energy	kWh/mt	3.0	2.4	2.1	2.9	2.6
Specific Power	kWs/m^3	531.6	443.0	396.7	491.3	447.8
Fresh Feed P80	mm			25.1		
Fresh Feed P50	mm			19.1		
Fresh Feed P25	mm			10.7		
Feed % Passing 5mm	%			14.4		
Product P80	mm	8.0	9.0	10.6	8.8	7.8
Product P50	mm	2.7	3.2	4.1	3.5	3.3
Product P25	mm	0.5	0.6	0.9	0.8	0.6
Product % Passing 5mm	%	65.2	61.0	55.1	60.6	63.0
P80 Reduction Ratio	-	3.1	2.8	2.4	2.9	3.2
P50 Reduction Ratio	-	7.0	5.9	4.6	5.4	5.7
P25 Reduction Ratio	-	20.6	17.0	12.6	13.6	16.7

* Percentage of total feed that was screened oversize material from Drum B.
† Seven percent moisture was targeted, but the sample only retained 4% moisture.

13.5 2015 Metallurgical Testing

The purpose of the 2015 metallurgical testing program was to:

- Conduct chemical and mineralogical analyses on all variability geo-unit composites. Perform mineralogical analyses by QEMSCAN Bulk Mineral Analysis (BMA) on variability samples to determine mineral content.
- Complete a series of ore hardness tests on geo-unit composites.
- Conduct batch rougher and open circuit cleaner flotation tests on each variability composite.
- Conduct locked cycle flotation test work on 45 variability composites suitable to update metal recoveries to be used for mine reserve and economic modeling.
- Investigate use of Cytec gold promoter MX-900 and its effect upon gold recovery.
- Process a bulk sample through the pilot plant to produce concentrate and tailings for dewatering test work.
- Validate previously determined process design information.

A total of 100 variability composites, representing 6 geo-units, were tested in this program.

Recovery data for each of the six GUCs was updated with 2015 metallurgical testing results (Table 13-13). Total copper and silver recoveries were based on 2015 flotation recovery. Total gold recoveries were based on 2015 flotation recovery plus 2014 gravity gold incremental gold recovery. The 2014 incremental gravity gold recovery is based on an open circuit IsaMill primary regrind mill. The current BE design has replaced the open circuit IsaMill with a closed circuit vertimill for primary regrinding. This may impact incremental gold recovery and should be reviewed prior to detail engineering as noted in Section 26.2.2 recommendations.

Table 13-13: 2015 Metal Recoveries (%)

2015 Recoveries			
Geo-unit Composite	**Cu**	**Au***	**Ag**
1	88.2	86.5	75.9
2	86.9	87.8	75.9
3	85.1	87.9	75.9
4	78.8	81	75.9
5	88	87.6	75.9
6	76.6	88.4	75.9

*Includes +2.7% incremental recovery from gravity circuit

14 Mineral Resource Estimates

14.1 Introduction

The following mineral resource estimate (MRE) is the first completed since AME completed an MRE associated with the 2011 Feasibility Study. From 2011 through 2014, KAM embarked on several programs of in-fill drilling, core relogging, and geological re-interpretation that are ongoing. During the period between 2012 and March 2015, the resource block model was constructed and modified as new data was added, to generate a robust MRE.

This section describes the methodology and summarizes the key assumptions considered by KAM to prepare the resource statement for the Ajax Project. The MRE was prepared under the direction of Christopher J. Wild, P.Eng, Chief Geologist at Ajax, conforming with generally accepted CIM "Estimation of Mineral Resource and Mineral Reserves Best Practices" guidelines and are reported in accordance with the Canadian Securities Administrators' National Instrument 43-101.

The resource estimate was generated using drill hole sample assay results and an interpretation of the geologic model which relates to the spatial distribution of copper and gold. In KAM's opinion, the current drilling information is sufficiently reliable to interpret the boundaries of the copper-gold mineralization and the assay data's reliability supports the mineral resources estimation. Interpolation characteristics were defined by the geology, drill hole spacing and geostatistical analysis of the data.

14.2 Resource Database

All drilling data at Ajax is stored in a central digital database in Kamloops and exported as collar, survey, assays and geology CSV files. QA/QC protocols and validation of surveys were in place during the execution of drilling programs to ensure that data integrity met industry standards. A description of the data verification is included in Section 12 of this report.

The data was validated during the import into Datamine® mining software to ensure there were no unexplained gaps in the data, nor any overlapping intervals or unusual collar elevations. Survey data at each collar location and consistency of holes names between input tables was confirmed. No errors were found during the import.

As of December 31, 2014, the Ajax database consisted of 1,170 drill holes with a cumulative length of 255,250 m. To estimate the mineral resources of the Ajax deposit, only drill holes proximal to the potentially economic mineralization were selected. Therefore, the mineral resource database is a sub-set of the Ajax database and consists of a total 208,050 m of drilling in 665 drill holes.

14.3 Domains & Coding

The modelling of the mineralized zones was undertaken in Datamine® and MineSight® mining software packages using conventional sectional interpretation (north-south oriented sections). The approach was to outline continuously developed grade zones with a nominal 0.1% Cu cut-off. String outlines of the mineralized zones were digitized on screen along drill lines, and "snapped" to drill holes to ensure accuracy of the mineralization boundaries. The interpretation was reconciled to plan views. Analysis of the spatial distribution of Au-Ag in relation to Cu shows reasonable spatial correlations among these 3 metals, supporting the creation of Cu-Au-Ag mineralized domains. Figure 14-1 and Figure 14-2 show the correlation between the metals for Domain 10.

Internal dilution was limited by not allowing drilling intervals greater than about 10 m grading <0.1% Cu to be included in the mineralized zones. Intervals >10 m with assays <0.1% Cu were digitized separately and excluded from the mineralized zones (internal waste).

Three separate domains of Cu-Au-Ag mineralization (Domains 10, 11 and 12) and two domains of "internal waste" (Domains 20 and 21) were interpreted (Figure 14-3). Mineralization marginal to Domains 10, 11 and 12 was included in a fourth unconstrained domain (domain 30) – see Figure 14-1. These domains were used to constrain grade estimation. All domain boundaries were considered hard for estimation purposes (only data internal to a domain could be used to estimate material within that domain), except for the boundary between domains 10 and 11.

Post-mineralization felsic dykes (monzonite-aplite-latite) are barren and have contributed to the interpretation of internal waste.

Drill hole assays were coded from the cross sectional interpretations using MineSight® software. Drill hole assay intervals were coded as being completely inside or outside a domain. The cross section polygons were "snapped" to the ends of the assay intervals making this process more accurate.

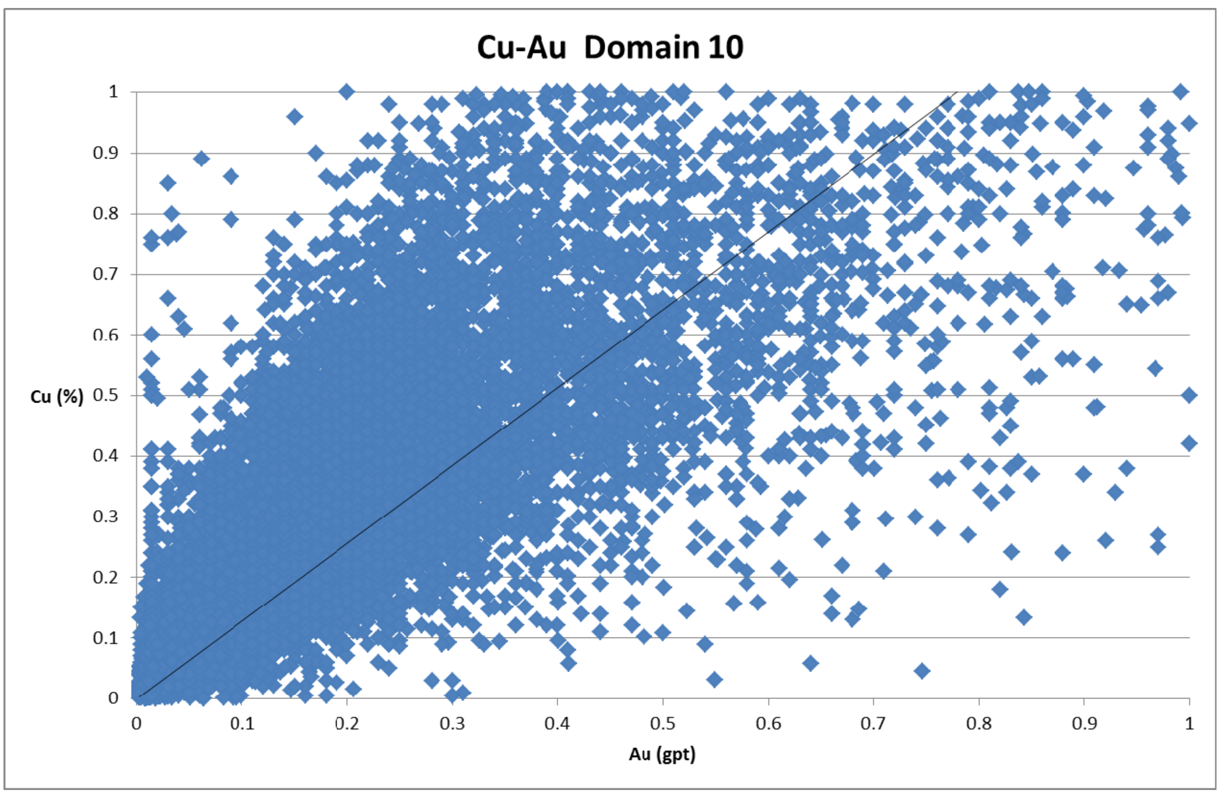


Figure 14-1: Correlation between Cu & Au in Domain 10

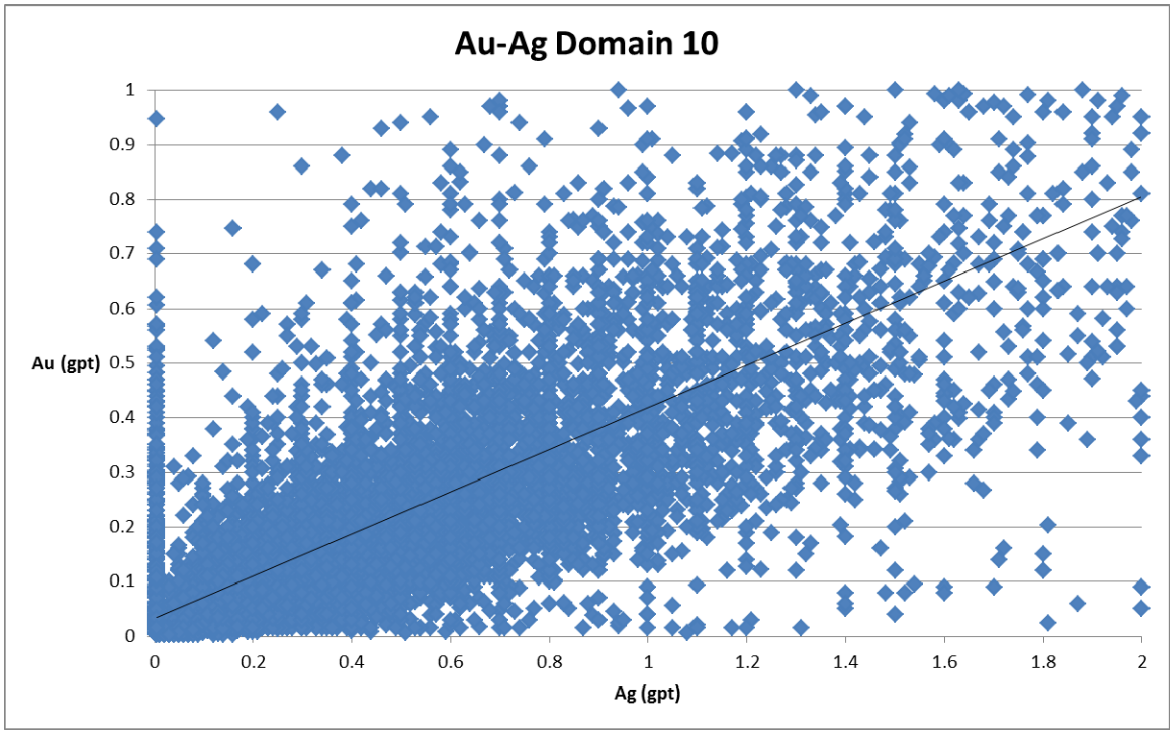


Figure 14-2: Correlation between Au & Ag in Domain 10

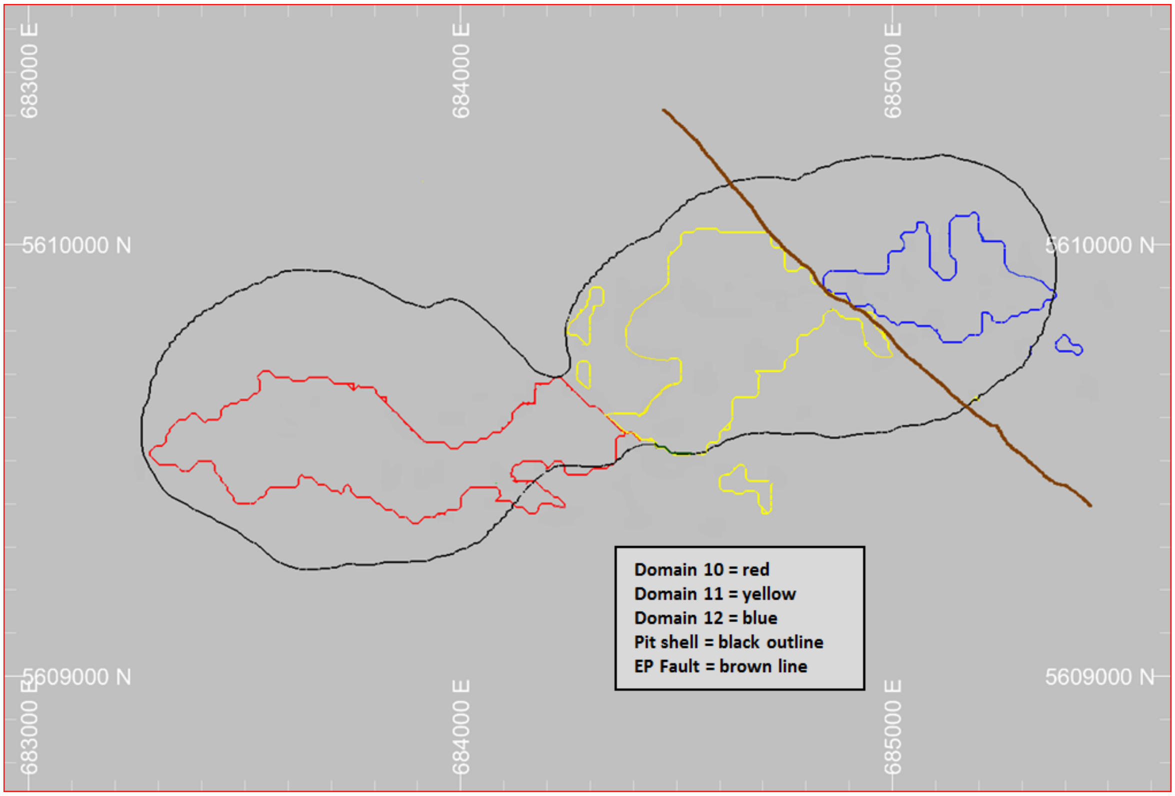


Figure 14-3: Plan View Showing Interpreted Mineralized Domains at Elevation 750RL

14.4 Capping/ Composites

Approximately 72% of all assays have a sample length of 3.0 m and 94% of the samples have a length between 2.0 m and 3.0 m. Considering the uniformity of the sample length and to maintain a reasonable level of sample variance, it was decided to use the assay samples for the estimate without compositing.

A statistical analysis of the data for each domain was done to determine outliers, followed by an examination of the spatial distribution of these high-grade values. The outlier values were capped to the high grade values selected for each domain. Details of the statistical analysis of the data and the capping values are in Table 14-1.

Table 14-1: Basic Statistics by Domain

Domain	Metal	Count	Min	Max	Mean (uncapped)	Mean (capped)	Cap value	# samples capped	#meters capped
10,11	Cu (%)	27,310	0.000	11.600	0.338	0.335	3.0	50	123
	Au (g/t)	26,121	0.003	38.100	0.205	0.203	2.5	33	88
	Ag (g/t)	21,461	0.005	8.000	0.441	0.432	5.0	35	93
12	Cu (%)	4,482	0.002	8.100	0.356	0.352	2.5	10	18
	Au (g/t)	4,477	0.003	6.320	0.282	0.278	2.0	17	32
	Ag (g/t)	4,477	0.005	30.000	0.560	0.548	6.0	9	18
20	Cu (%)	2,596	0.001	1.310	0.006	0.005	0.8	4	12
	Au (g/t)	2,591	0.003	3.000	0.040	0.038	0.8	6	18
	Ag (g/t)	2,396	0.005	5.000	0.073	0.072	2.0	1	3
21	Cu (%)	1,087	0.001	1.270	0.058	0.058	0.8	3	9
	Au (g/t)	1,087	0.003	1.200	0.046	0.045	0.6	3	6
	Ag (g/t)	1,087	0.050	45.000	0.177	0.134	2.5	5	13
30	Cu (%)	42,802	0.000	4.890	0.047	0.047	2.5	11	21
	Au (g/t)	42,652	0.003	9.200	0.039	0.038	2.5	18	46
	Ag (g/t)	40,755	0.005	55.200	0.109	0.099	3.0	77	158

14.5 Bulk Density

The bulk density of Ajax drill core was determined using the conventional procedure of weighing the samples dry and immersed in water. The bulk density is determined by the relation:

bulk density = weight in air / (weight in air – weight in water)

The Ajax bulk density database contains 855 data points; measurements were taken during the period of 2006-2008. No additional measurements were added to the density model for the 2015 block model update.

A statistical analysis of the data was completed in 2013 to determine if the Sugarloaf Diorite in the West and East areas of the Ajax deposit has different bulk density results; albite alteration of the Sugarloaf Diorite was also reviewed to determine if it has a significant impact on the bulk density results. This work concluded that there is no significant change in bulk density measurements along the strike of the orebody (west-east) and the albite alteration doesn't have a significant impact on these values.

The bulk density values used in the estimation for each rock type and material type are listed in Table 14-2.

Table 14-2: Average Bulk Density by Rock Type

Rock Type	Average Bulk Density
SLD (Sugarloaf Diorite)	2.75
SVHYB (Sugarloaf Volcanic Hybrid)	2.83
IMH (Iron Mask Hybrid)	3.09
MVOLC (Mafic Volcanic)	2.89
PXPP (Pyroxene Porphyry)	2.89
PICR (Picrite)	2.89
FILL (Backfill)[1]	2.0
OVBN (Overburden)[1]	2.0

Note: Bulk density value of 2.0 was assigned to block coded as backfill and overburden material.

14.6 Spatial Analysis

Down hole and directional experimental variograms of mineralized domains 10, 11 and 12 were constructed and evaluated using Snowden Supervisor® software. The directional variograms were calculated using 3 m composites.

The resulting variograms from each mineralized domain were of poor quality (noisy or unstable variograms). Best-fit models provided a direction of greatest continuity that roughly corresponded to the strike and dip of the mineralized zones. The search strategy was therefore based primarily on the drill hole spacing and the geometry of the deposit.

In Domain 10, the 3 m composites have greater continuity in two directions: in a horizontal direction at an azimuth of N105° (along strike) and along a dip of 60°. Similarly, Domain 11 grades showed better continuity in a horizontal direction at an azimuth of N045° and along a dip of 50°. Both Domains 10 and 11 displayed a shorter range of grade continuity across-strike. Domain 12 grades were most continuous along strike (oriented N090°) with an intermediate range along dip (vertical orientation) and the shorter range across strike.

14.7 Block Model

The block model was initialized in Datamine's Studio 3® resource modelling software and the dimensions are defined in Table 14-3. The criteria used in the selection of the block size included the drill hole spacing and the size of the selective mining unit which is typical for an operation of this type and scale. The model has not been rotated.

Model blocks were coded from the cross sectional interpretations using MineSight® software. Blocks were coded by "majority code" in which a block is assigned the code of the domain that occupies the largest volume of the block. For example if a block is 45% inside domain 1, 40% in domain 2, and 5% in domain 3 the block would be coded domain 1.

The proportions of the blocks that occur below the topographic surface are also calculated and stored within the model as percentage items. These values are used as a weighing factor to determine the in-situ mineralized material for the deposit.

Table 14-3: Block Model Parameters

	Easting	Northing	Elevation
Minimum	682860	5608680	0
Maximum	686280	5610780	1080
Block size (m)	15	15	15
Number of blocks	228	140	72

14.8 Interpolation

Grade estimation was undertaken using Datamine's Studio 3® software. The block model grades for copper, gold and silver were estimated using Inverse Distance Weighing (IDW) methodology and length-weighted capped assay data. The results of IDW estimation to the power of 2, 3 and 4 were evaluated and compared using a series of validation approaches described in Section 14.11. The interpolation parameters were adjusted until an appropriate result was obtained. The results from ID4 estimates proved to be the most accurate when compared statistically and spatially to the drill data.

The search / interpolation ellipse orientation and ranges used for grade estimation correspond to the known mineralization trend of the deposit. The grade estimates were bounded by 3D wireframes (Domains 10-11-12-20-21).

The sub-vertical East Pit Fault interpreted from drilling in the eastern half of the deposit shows a displacement of approximately 150 m. This fault was treated as a hard boundary during the interpolation of grades in the model.

The grade estimation was carried out in two passes (except Domain 30 with three passes), with each successive pass using more liberal composite selection parameters than the previous one (Table 14-4). Approximately 82% of the blocks in Domains 10-11 were filled in the first pass, while Domain 12 had approximately 65% of the blocks filled in the first pass.

Table 14-4: Interpolation Parameters

Domain	Orientation[1]	Estimation Pass	Search Ellipse Range(m)			Number of Samples		
			Major	Semi-Major	Minor	Min/block	Max/block	Max/hole
10	15/60/0	1	70	70	35	6	15	5
		2	210	210	105	1	15	5
11	-45/50/0	1	60	60	30	6	15	5
		2	180	180	90	1	15	5
12	0/60/0	1	60	75	40	6	15	5
		2	180	225	120	1	15	5
20	-45/50/0	1	60	60	30	6	15	5
		2	180	180	90	1	15	5
21	0/60/0	1	60	75	40	6	15	5
		2	180	225	120	1	15	5
30	0/0/0	1	25	25	25	5	5	5
		2	50	50	50	6	15	5
		3	75	75	75	1	15	5

Note: 1. The numbers represent the rotation angles of the search ellipse using a ZXZ convention; i.e. the 1st number is the 1st rotation angle around the Z axis, the 2nd number is the 2nd rotation angle around the X axis and the 3rd number represents the 3rd rotation angle around the Z axis.

14.9 Mineral Resource Classification

During the grade estimation process, a "transformed distance"[1] to the nearest drill hole sample (MINDIS), the search volume estimation pass (SVOL) and the number of samples used in the estimation (NUMSAMP) were stored in the block model. Using these values as a basis, blocks were classified as follows:

- All blocks within the mineralized domains 10, 11, and 12 were coded as Indicated.
- Blocks within domains 10 and 11 with MINDIS<=0.5, SVOL=1 (1st estimation pass) and NUMSAMP=15 were upgraded to Measured.
- Blocks within domain 12 with a SVOL=2 (2nd estimation pass) and a MINDIS>=0.8 were downgraded to Inferred.
- Measured blocks within domain 10 and 11 were downgraded to Indicated if they were estimated using more than 60% assays from Legacy drill holes.[2]
- All blocks that were 100% inside Domain 30 were coded inferred.
- A transformed distance (MINDIS) in Datamine® is calculated for each sample. To calculate the transformed distance the sample data is first rotated into the coordinate system of the search ellipsoid. The MINDIS is the distance of a sample to the centre of the ellipsoid, and is equal to 1 when a sample is lying precisely on the search ellipsoid. When samples are inside the ellipsoid the MINDIS is less than 1.

14.10 Mineral Resource

To ensure that the reported resource estimate exhibits reasonable prospects for economic extraction by an open pit, KAM used the Whittle software and Lerchs-Grossmann (LG) optimizing algorithm to evaluate the profitability of each resource block (Measured, Indicated and Inferred blocks) according to its value. Optimization parameters are summarized in Table 14-5. Resource blocks located within the pit shell are considered to have "reasonable prospects for economic extraction" by an open pit and are reported below in the Mineral Resource Statement.

Table 14-5: Assumptions Considered for Open Pit Optimization

Parameter Name	Units	Parameter Value
Copper Price	US$/lb	4.00
Gold Price	US$/oz	1800
Silver Price	US$/oz	26.00
NSR Cut-off	US$/t	7.10
Exchange Rate	US$/C$	1.06
Mining Dilution		None
Mining Loss		none

[1] A transformed distance (MINDIS) in Datamine® is calculated for each sample. To calculate the transformed distance the sample data is first rotated into the coordinate system of the search ellipsoid. The MINDIS is the distance of a sample to the centre of the ellipsoid, and is equal to 1 when a sample is lying precisely on the search ellipsoid. When samples are inside the ellipsoid the MINDIS is less than 1.
[2] Legacy drill holes correspond to drilling completed during the period 1981 to 1990.

The pit shell generation was constrained by the presence of Jacko Lake. A hard boundary of 50 m from the NE Arm and 50 m from SE Arm was used to constrain the pit.

A total NSR was calculated by adding the NSR attributable to copper to the NSR attributable to gold to the NSR attributable to silver and then subtracting the freight costs, which include land freight, port charges, ocean freight, penalties and other miscellaneous costs. A list of NSR calculation parameters is presented in Section 15.

For the Mineral Resource and Mineral Reserve Estimates, the mineral resource block model was adjusted adding several new items to convert it into a mining model. In order to verify the generation of the pit shells that define the final pit limit, as well as the mining phases of the deposit, the block model was coded using the defined slope zones, inter-ramp slopes angles, and required berm widths. Finally, the total economic value per block was calculated for use in the application of the LG algorithm in the pit shell generation process.

Table 14-6 contains the summary of mineral resources for the Ajax Project.

Table 14-6: Mineral Resource Summary – NSR Cut-off of US$7.10/t Ajax Project

Classification	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)
Measured (M)	148	0.28	0.18	0.37
Indicated (I)	420	0.25	0.18	0.35
M + I	568	0.26	0.18	0.35
Inferred	29	0.13	0.09	0.17

Notes: 1. CIM Definitions were followed for Mineral Resources. **2.** Mineral resources are estimated at an NSR cut-off of $7.10. **3.** Mineral resources are estimated at US$4.00/lb Cu, US$1800/oz. Au, and US$26/oz. Ag. **4.** Inferred blocks were included in generating pit shell. **5.** Mineral resources are reported inclusive of mineral reserves. **6.** Tonnages and grades are rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding. **7.** Mineral resources that are not mineral reserves do not have demonstrated economic viability.

14.11 Block Model Validation

Numerical and visual assessment of the block model was completed to validate the successful application of the estimates and to ensure that all blocks within the mineralized domains were estimated (where data allowed).

An on-screen validation between block grade estimates and informing capped composites in plan and section views confirmed a good match between the composites and block grades for all estimation variables taking into account the inherent smoothing effect expected in the estimate.

A comparison was made between drill hole data and the model block grades at the drill data locations. This is intended to show how well the estimate performed at locations with known grades. Given the estimation method of ID4 this comparison is not as meaningful as it might be with other methods but it is still valuable to check that the estimate is reasonable in localized areas. In order to perform this comparison, 15 m bench composites were generated from Cu, Au, and Ag assays and compared to the block grades that they intercepted. Results for Cu and Au are reasonable with some smearing at the higher and lower grade ranges (see Table 14-7 and Figure 14-4 to Figure 14-6). The Ag model grades do not correlate as well with smearing apparent in both the high-grade and low-grade areas. This should be reviewed and adjusted in future modelling efforts if possible.

Table 14-7: 15 m Bench Composites & Block Model Statistics by Metal

Element	Source	Min	Max	Mean	Median	Std Dev	CV
Cu (%)	Composites	0.001	2.450	0.162	0.092	0.193	1.190
	Model	0.001	1.847	0.159	0.096	0.185	1.170
Au (g/t)	Composites	0.002	3.016	0.109	0.055	0.147	1.340
	Model	0.003	2.173	0.106	0.057	0.135	1.270
Ag (g/t)	Composites	0.005	9.255	0.231	0.118	0.356	1.540
	Model	0.005	3.025	0.220	0.118	0.286	1.300

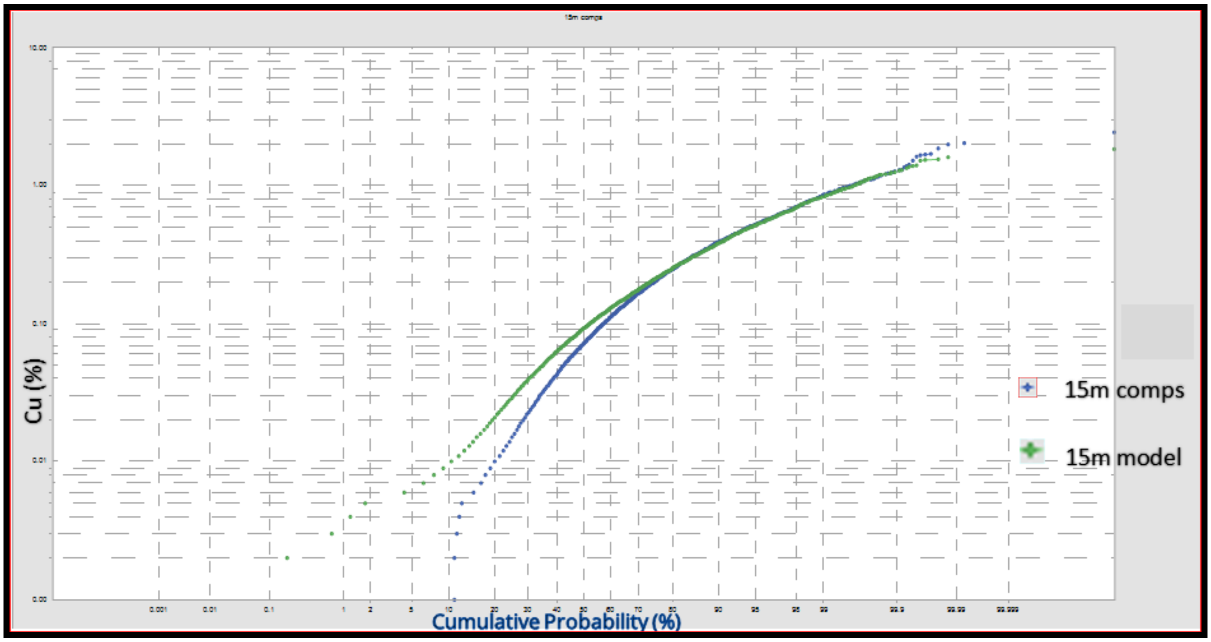


Figure 14-4: Cumulative Probability Plot for Mean Cu Grades of 15 m Bench Composite & Block Model ID4 Estimate

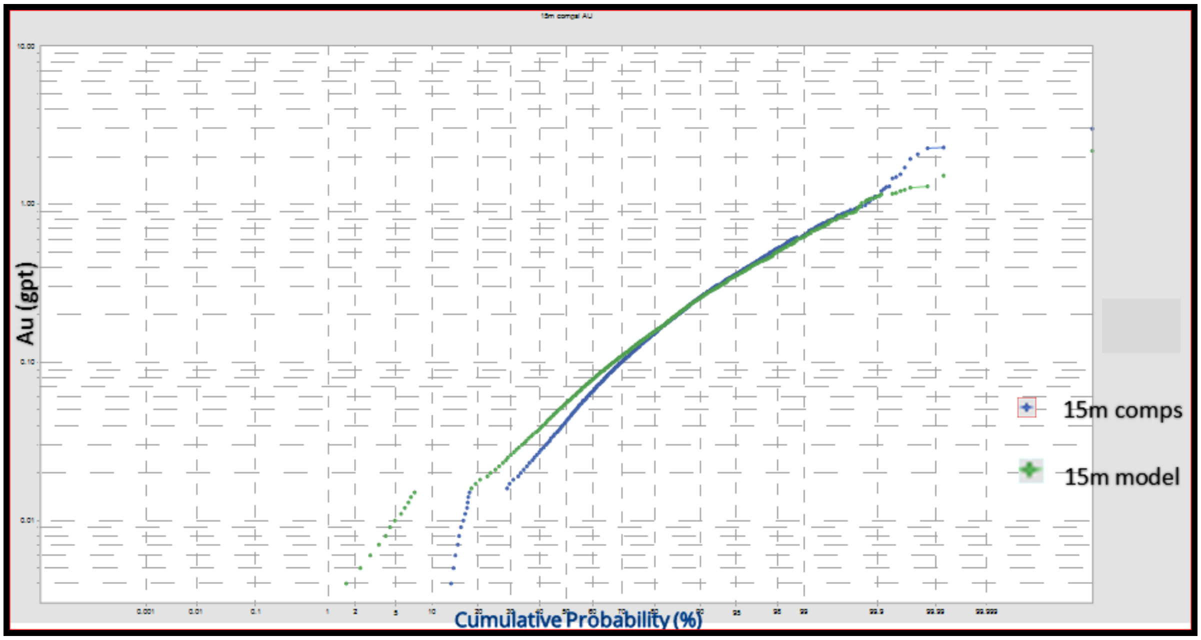


Figure 14-5: Cumulative Probability Plot for Mean Au Grades of 15 m Bench Composite & Block Model ID4 Estimate

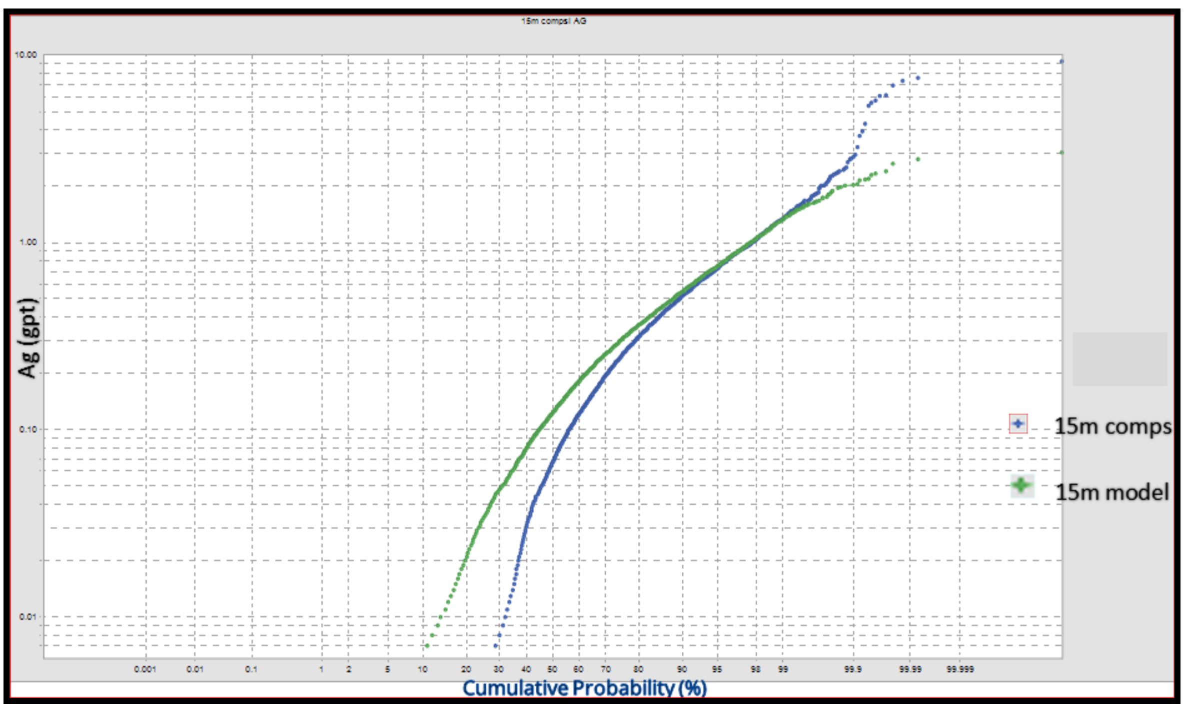


Figure 14-6: Cumulative Probability Plot for Mean Ag grades of 15 m Bench Composite & Block Model ID4 Estimate

15 Mineral Reserve Estimates

Mine planning and design work was carried out by KGHM Ajax in conjunction with KGHM International and Golder Associates Limited. Modifying factors described in this section were applied to the Resource block model described in Section 14 to arrive at the Mineral Reserve Estimate. The Mineral Reserve is reported within the designed pit and cut-off value as described in this section. The Reserve Estimate meets the CIM Definition Standards adopted by CIM Council on May 10, 2014.

15.1 Pit Shells (Pit Limits)

Economic pit shells were used to define the approximate phases and final pit extents. The selected economic pit shells were used as a guide to create detailed pit designs which included the access ramps and berms.

15.1.1 Methodology

The pit limits for the Ajax deposit were delineated using the Geovia Whittle Version 4.5.5 Lerchs-Grosman (LG) optimizing algorithm. Net smelter return (NSR) block values were used in the optimization algorithm. Only the blocks classified as Measured and Indicated were coded with an NSR value. Inferred blocks were treated as waste. Economic pit shells with the highest discounted cash flow values were analyzed to select the pit limits.

15.1.2 Pit Shell Optimization Parameters

15.1.2.1 Block Model

The resource block model described in Section 14 was used to create a mining block model, which was then used for the pit shell optimization. The mining block model was coded with geotechnical zones, pit slope and berm width criteria, diluted resource grades, metallurgical zones and recoveries, and NSR values. A selective mining unit (SMU) size of 15 m x 15 m x 15 m was selected to correspond with the expected equipment classes proposed for the Ajax project and matches the block size for the block model.

15.1.2.2 NSR Calculation

The total NSR for a block is calculated by adding the NSR value attributable to copper, gold, silver, and subtracting metal specific charges and penalties.

The block NSR attributable to copper is defined as the revenue generated from the payable portion of the recovered copper content (net of concentrate losses) less freight, treatment and refining charges. Block revenues are calculated for each block tonnage by multiplying the metal content within the block by the expected recovery, payable factor and selling price of copper. Using the recovered metal content and concentrate grade, the total quantity of dry concentrate is determined. The concentrate quantity (net of concentrate losses) forms the basis for freight (including assay/marketing/insurance costs), treatment, and refining charges. No price participation is included in the NSR calculation.

NSR attributable to gold and silver is calculated similarly to copper; however, freight and treatment charges are excluded. These charges are associated with the copper NSR only. Payable factors for gold and silver are dependent on the concentrate content of these elements.

Penalties are calculated for deleterious elements by comparing the copper concentrate content of each element to the defined penalty limits and applying penalty rates to those elements in excess of the thresholds. The content of deleterious elements reporting to the copper concentrate is calculated by multiplying block tonnage by the in-situ concentration, metallurgical recovery, and copper concentrate quantity.

The parameters used to calculate the total NSR per tonne of ore for each block are listed in Table 15-1.

Table 15-1: NSR Calculation Parameters

Parameter Name	Units	Parameter Value
Copper Price	US$/pound	3.21
Gold Price	US$/troy ounce	1,200
Silver Price	US$/troy ounce	17
Recovery for Copper	%	By MetZone[1]
Recovery for Gold	%	By MetZone[1]
Recovery for Silver	%	By MetZone[1]
Recovery for Mercury	%	By MetZone[1]
Recovery for Arsenic	%	By MetZone[1]
Copper Concentrate Grade	%	25
Copper Concentrate Moisture	%	10
Copper Concentrate Losses	% (weight)	0.25
Payable Copper	%	96
Payable Gold	%	Variable[2]
Payable Silver	%	Variable[2]
Copper Deduction	%	1
Gold Deduction	g/dmt concentrate	0
Treatment Cost	US$/dmt concentrate	80
Copper Refining Charge	US$/payable lb of copper	0.08
Gold Refining Charge	US$/payable oz of gold	5
Silver Refining Charge	US$/payable oz of silver	0.5
Mercury Penalty	US$/dmt concentrate	$0.15 for every 1 ppm > 20 ppm
Arsenic Penalty	US$/dmt concentrate	$3.00 for every 0.1% > 0.2%
Freight, Port, Assays, Marketing	US$/dmt concentrate	$142

Note 1. MetZone = Metallurgical Zone. Refer to Table 15-2
Note 2. Refer to Table 15-3

Table 15-2 lists the metallurgical recoveries used for each geological unit in the deposit.

Table 15-2: Metallurgical Recoveries by Geological Unit

Unit Description	% Recovery
Unit 1 - East Sugarloaf Diorites	
Copper	86.7
Gold	87.3
Mercury	26.2
Arsenic	15.8
Silver (Ag > 0.4 g/t)	75.6
Unit 2 - West Sugarloaf Diorite (Weak and Moderate Albite Alteration)	
Copper	89.5
Gold	84.9
Mercury	40.4
Arsenic	26.4
Silver (Ag > 0.4 g/t)	75.6
Unit 3 - West Sugarloaf Volcanic Hybrids and East Mafic Volcanics	
Copper	82.2
Gold	82.9
Mercury	56.8
Arsenic	45.0
Silver (Ag > 0.4 g/t)	75.6
Unit 4 - West Picrite, West Mafic Volcanic and East Mafic Volcanic	
Copper	80.2
Gold	76.8
Mercury	71.4
Arsenic	54.8
Silver (Ag > 0.4 g/t)	75.6
Unit 5 - West Sugarloaf Diorite (Strong Albite Alteration)	
Copper	84.9
Gold	81.0
Mercury	51.3
Arsenic	32.5
Silver (Ag > 0.4 g/t)	75.6
Unit 6 - West Iron Mask Hybrid (Strong Albite Alteration)	
Copper	86.3
Gold	88.1
Mercury	45.3
Arsenic	1.7
Silver (Ag > 0.4 g/t)	75.6

The payable factors for gold and silver are presented in Table 15-3.

Table 15-3: Gold and Silver Payable Factors

Payable Au (%)	Au Concentrate Grade (g/t)
97	> 15
96.5	10-15
96	7-10
95	5-7
93	3-5
90	1-3
0	< 1
Payable Ag (%)	**Ag Concentrate Grade (g/t)**
90	≥ 30
0	< 30

15.1.2.3 Operating Costs & Cut-Off Value

A reference mining cost of $1.45 per tonne was used for the generation of pit shells. The reference mining cost includes average drill, blast, load, and support costs, as well as a reference haul cost from the pit exit elevation at 900 masl (meters above sea level) elevation. The breakdown of the mine operating cost is detailed in Table 15-4. An incremental haul cost of $0.02/t was added to each bench below the reference elevation.

Table 15-4: Mine Operating Costs

Item	Unit	Ore
Drill	$/t	0.09
Blast	$/t	0.25
Load	$/t	0.21
Haul	$/t	0.71
Support	$/t	0.19
Total	**$/t**	**1.45**

Note: This unit cost estimate is only the basis of the LG optimization work, not the final mining cost. Haulage cost is based on the reference elevation (900 masl).

An average life of mine processing cost of US$4.39 per tonne milled was used. A site general and administrative (G&A) cost of US$1.20 per tonne milled was added to the processing cost. Together with the miscellaneous costs shown in Table 15-5, a total processing cost of US$7.10 per tonne milled was used for pit optimization. The processing cost was also used as the NSR cut-off value for production scheduling and reporting of Mineral Reserves.

Table 15-5: NSR Cut-off Value Calculation

Item	$/t milled
Processing Cost	4.39
Site G&A	1.20
Mining General	0.87
TSF Sustaining Capital	0.34
Closure	0.17
Daily Ore Re-handle Allowance	0.11
Topsoil Removal	0.02
Total Cost	**7.10**

The costs found in Table 15-4 and Table 15-5 were based on preliminary first principle calculations. The Mineral Reserves are sensitive to higher costs, which would negatively affect the project economics.

15.1.2.4 Dilution & Mining Losses

There are many factors that can affect the amount of dilution and ore loss which occurs when mining. To estimate the dilution that could occur during extraction of the ore, the in-situ grades from the resource model were diluted in the mining block model. Dilution within mineralized blocks was calculated using a MineSightTM dilution script. The script was used to remove mineralized blocks from the Mineral Reserves that are unlikely to be successfully separated during mining operations. The MineSightTM script applies dilution by the following criteria:

- if a mineralized block has two or more waste blocks surrounding it a 30% dilution factor is applied to the mineralized blocks grades.
- if a mineralized block has three or more waste blocks surrounding it the mineralized blocks grades are averaged by the total tonnage of the mineralized block plus the waste blocks.

Applying the MineSight^{TM} dilution script resulted in a 3.5% reduction in ore tonnage within the designed pit.

There is risk that the estimated dilution is underestimated and this would negatively affect the Mineral Reserves and project economics.

A mining loss of 2% was applied to all mineralized blocks in Whittle. The estimated mining loss is based on the following pro-active measures:

- Global Positioning System (GPS) on loading equipment for accurate grade control.
- High precision electronic detonators for accurate blast timing.
- Blast simulation software for blast modelling/movement predictions.
- Dispatch system to prevent misplacement of ore and waste.

Mining losses higher than 2% would negatively affect the Mineral Reserve estimate and project economics. During operations reconciliation should be done to check the actual ore loss is not greater than 2%.

15.1.2.5 Hydrological & Geotechnical

Development of the mine will include expansion of the existing open pits, which are located immediately east of Jacko Lake. An understanding of the hydrogeology in the vicinity of Jacko Lake is required to assess the potential hydraulic connection, and evaluate whether open pit mining will potentially affect the lake. *Klohn Crippen Berger* completed a hydrogeological assessment of the Jacko Lake and open pit interaction area. The key findings are summarized below:

- Overburden between Jacko Lake and the proposed pit consists primarily of low permeability clay till, with discontinuous sand/gravel lenses of varying thickness and limited continuity.
- Overburden thickness varied from approximately 10 to 40 m with increasing thickness to the south.
- Bedrock between Jacko Lake and the proposed pit has low hydraulic conductivity.
- The inferred Jacko Lake bed sediment has a low hydraulic conductivity resulting in minimal seepage loss from Jacko Lake.
- No discrete hydraulic conduits (e.g., such as permeable fault or shear zones) were identified between Jacko Lake and the proposed pit.

- Seepage from Jacko Lake towards the pit is predicted to be <1.0 L/s, when the pit is fully developed, under steady state conditions (0.6 L/s seepage to the underlying till, and 0.1 L/s laterally toward the pit).

Eight geotechnical domains shown in Figure 15-1 were established based on geometric, geological, rock mass quality characteristics, and hydrogeological considerations. Based on this data, *SRK Consulting* derived pit slope design parameters. These parameters are shown in Table 15-6, divided by geotechnical domain and geological unit. Geotechnical berms were then incorporated as a part of the pit designs. Pit optimizations using Whittle were completed with flattened pit slopes to account for pit ramps. Pit walls were flattened by 2.1° in each sector containing a ramp section.

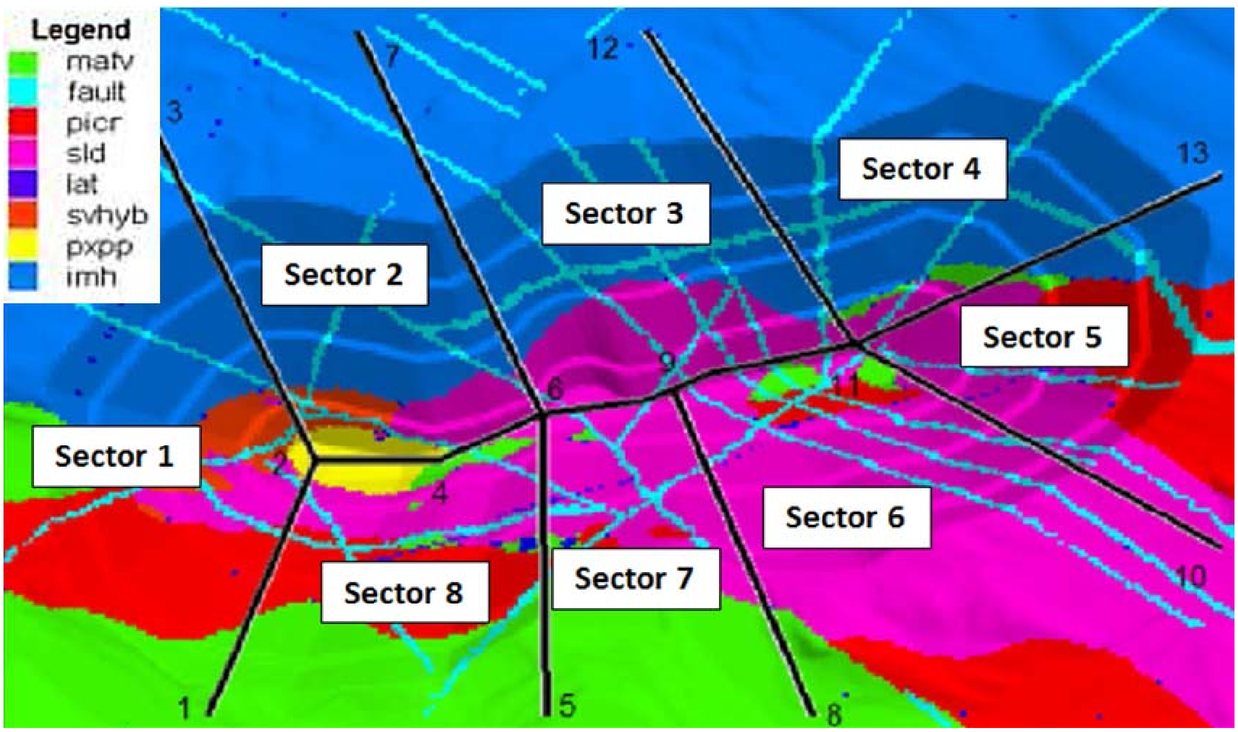


Figure 15-1: Geotechnical Domains

Table 15-6: Pit Slope Design Details

Sector	Geo Unit	Bench Height (m)	Bench Face Angle (º)	Berm Width (m)	Bench Stack Angle (º)	Inter Ramp Angle (º)	Geotechnical Berm (m)	Maximum Overall Slope Angle (º)
1	IMH/PXPP – LAT	30	75	17	54.2	50.2	25	48
	SLD	30	75	18	53.2	49	25	
	PICR (NVP)	30	65	16	48.2	45	25	
	MAFV (NVV)	30	65	16	48.2	45	25	
2	IMH / PXPP – LAT	30	75	17	54.2	50.2	25	48
	SLD	30	75	18	53.2	49	25	
3	IMH	30	75	17	54.2	50.2	25	50
	SLD	30	75	18	53.2	49	25	
4	IMH	30	75	17	54.2	50.2	25	53
	SLD	30	75	18	53.2	49	25	
5	IMH	30	75	17	54.2	50.2	25	53
	SLD	30	75	17	54.2	50.2	25	
	PICR (NVP)	30	65	16	48.2	45	25	
6	SLD (*)	30	70 (75)	20 (17)	48.1 (54.2)	44.1 (50.2)	40 (30)	45
	PICR (NVP) (*)	30	65	16.5	47.8	44.5	40 (30)	
7-8	SLD	30	75	17	54.2	50.2	25	52
	PICR (NVP)	30	65	16	48.2	45	25	
	MAFV (NVV)	30	65	16	48.2	45	25	
	SLD / PXPP - LAT	30	75	17	54.2	50.2	25	

Note. The above table should be considered with the sectional illustration of slope design geometries shown in Figure 15-2. Geo-units refer to rock types and are listed in Table 15-2 along with their abbreviations.

Bench stacks (distance between geotechnical berms) are recommended to not exceed 150 m in height and must be de-coupled with 25m geotechnical berms. Definitions of key slope design parameters and a conceptual example of the pit slope configuration is presented in Figure 15-2.

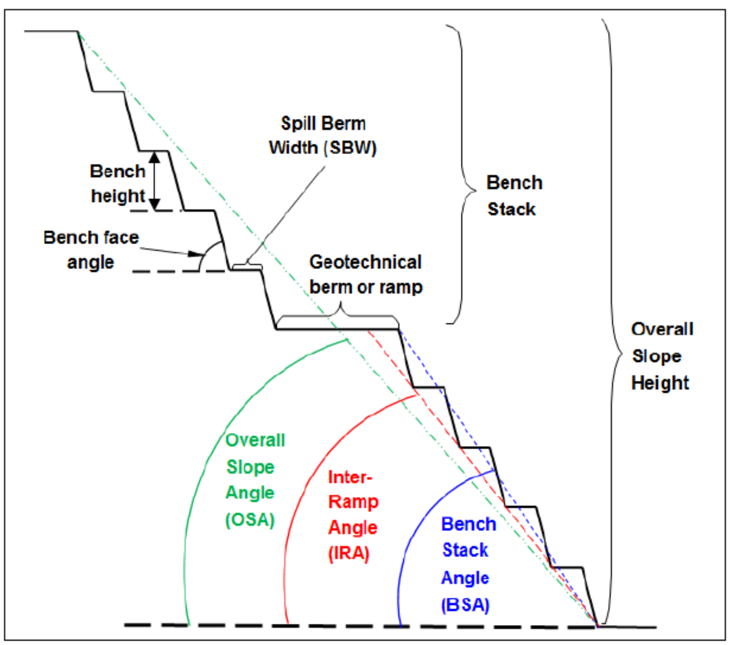
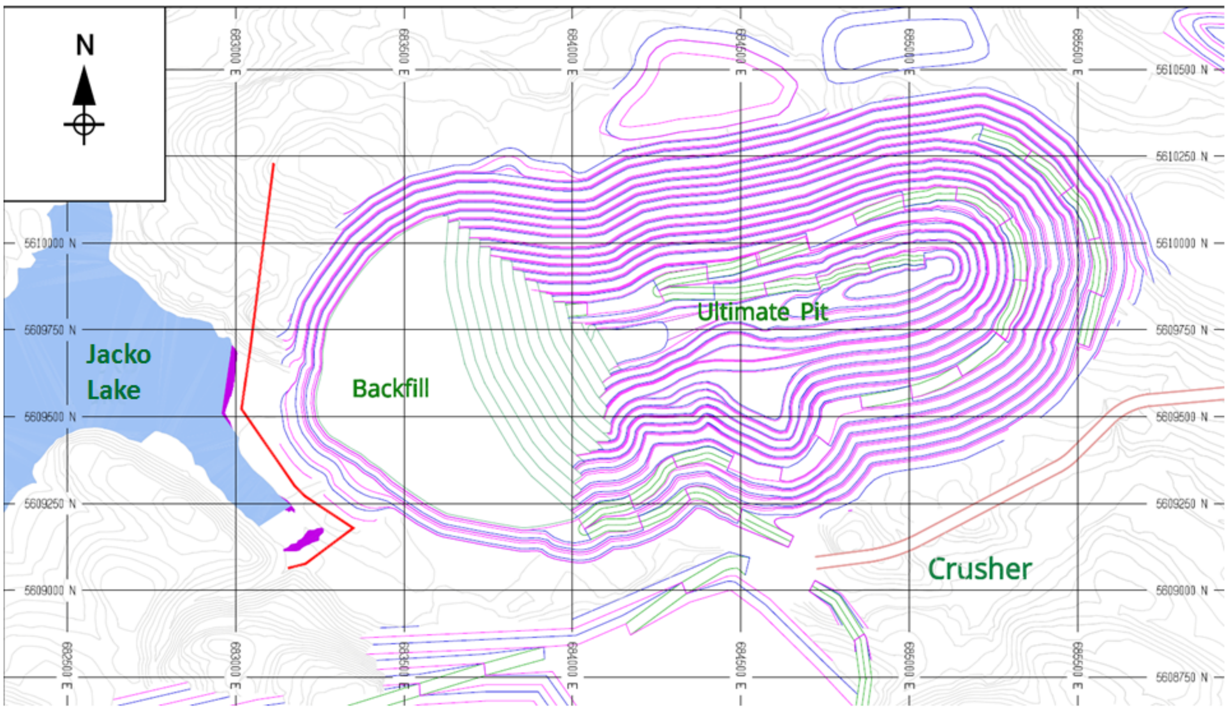


Figure 15-2: Definitions of key slope design parameters and conceptual example of the pit slope design and bench configuration

15.1.2.6 Constraints

Pit shell generation was based on the assumption that the Trans Mountain Pipeline, an oil pipeline operated by Kinder Morgan that runs along the western limit of the proposed Ajax pit, would be relocated away from the pit before the start of mining operations. There is risk to the project economics if this pipeline is not moved and subsequently creates another pit constraint, which would decrease Mineral Reserves. Construction of the Northeast Arm and Southeast Arm dam would be completed prior to the start of mining operations.

The pit shell generation was also constrained by the presence of Jacko Lake. A 50 m hard boundary from the planned Northeast Arm dam and 50 m from the Southeast Arm was used to constrain the pit shown in Figure 15-3.



Note: Solid red line between Jacko Lake and the pit limits indicates the pit shell generation hard boundary.

Figure 15-3: Pit Limit Hard Boundary

The pit is unconstrained to the north, east and south. All the major infrastructure facilities planned for the project, including mineral processing facilities, stockpiles, mine rock storage facilities, offices, maintenance shops, fuel storage, tailings pond, and water storage ponds, will be external to the ultimate pit design and its area of influence.

The natural topographic surface at the Ajax site is based on a June 4, 2013 survey by Airborne Imaging.

15.1.3 Pit Shell Selection

A series of nested economic pit shells were generated in Whittle by varying the selling prices of the various metals in the mining model. The ultimate pit was selected based on a discounted cash flow analysis using the LG algorithm. This economic analysis identified a range of pit shells which maximized discounted cash flows and supported a suitable mine life. From this range, a single pit shell, revenue factor 0.95, was selected as the ultimate pit limit. Pit shells beyond the selected pit showed unfavorable reductions in discounted cash flows due to marginal increases in ore and increasing stripping ratios.

Interim pit phases were also selected based on the nested pit shells. The economic pit shells that showed incremental strip ratio steps were selected as interim pit phases.

15.2 Pit Design

Detailed ultimate pit and phase designs were completed using the selected economic pit shells as guides.

15.2.1 Methodology

Pit designs were completed using the MineSight™ design software to define bench toe and crest limits, access ramps, and catchment benches. The design process evaluated multiple access ramp locations to identify an appropriate pit configuration that would maximize the ore extraction within the selected economic pit shell. The ultimate pit design was based on the equipment selected to mine the pit, geotechnical criteria, operational efficiency, and economic considerations.

15.2.2 Pit Design Parameters

The following operational parameters were used in the pit design:

- Bench height, single-bench mining……………………………………..15 m
- Height between catch benches ……………………………………30 m (double bench)
- Minimum mining width…………………………………………………100 m
- Ramp width (two way traffic) ……………………………………………35 m
- Pit bottom ramp width (maximum 2 segments, single lane) …………25 m
- Maximum ramp grade…………………………………………………10%

All areas of the open pit contain double bench designs with the exception of the overburden zones where single benches are designed.

The ramp widths were calculated on the assumption that 300 tonne class haul trucks would be used. For two way traffic, the ramp driving surface was designed for 3 times the width of the haul truck. For single lane traffic the ramp driving surface was designed to be 2 times the width of the haul truck. Additional width included in the ramp design accounted for a berm which is designed to be ¾ the height of the haul truck tire, plus width for a drainage and utilities ditch. The ramp design parameters follow the *Health, Safety and Reclamation Code for Mines in British Columbia*.

15.2.3 Reserve Pit Design

The ultimate pit is approximately 2.7 km in an east-west direction and approximately 1.3 km in a north-south direction. The ultimate pit depth is approximately 550 meters, from 990 masl crest to the pit bottom elevation of 435 masl. Figure 15-4 shows an illustration of the ultimate designed pit.

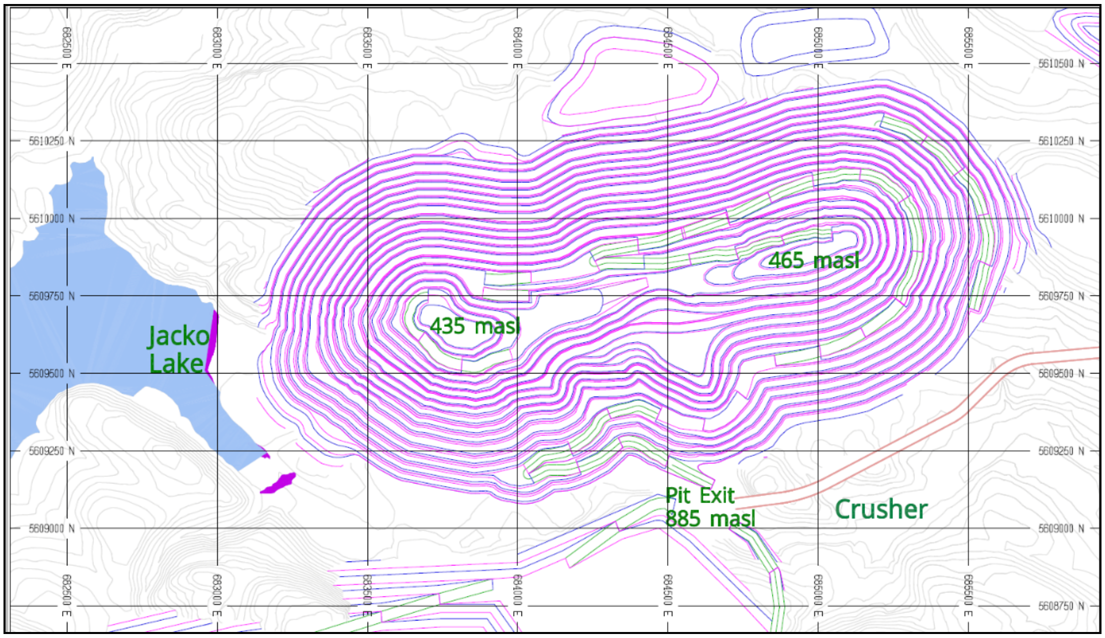


Figure 15-4: Ultimate Pit Illustration

15.3 Factors Affecting Reserve Estimates

Factors which may affect the Mineral Reserve estimates and project economics include:

- Ability to move the oil pipeline
- Successful development of the Peterson Creek diversion and Jacko Lake containment.
- Effective surface and ground water management will be important to the safety and productivity of the mining operation
- Effectiveness of the dilution model
- Estimated mining loss assumption
- Metal price assumptions
- Metallurgical recoveries
- Geotechnical characteristics of the rock mass
- Ability of the mining operation to meet the planned annual throughput rate assumptions for the process plant
- Capital and operating cost estimates
- Effectiveness of surface and ground water management
- Obtaining required permits and social licenses
- Accuracy of the Resource block model and geological interpretation
- Unrecognized structural complications in areas with relatively low drill hole density could introduce unfavourable pit slope stability conditions

15.4 Mineral Reserve Statement

The Mineral Reserve are reported assuming long term metal prices of US$3.21/lb copper, US$1,200/t.oz Gold, and US$17/t.oz Silver with an effective date of December 31, 2014. Metal prices are based on KAM's long term Mineral Reserve prices.

Mineral Reserves have been modified from the Mineral Resources by taking into account the geotechnical, mining, processing, location constraints, and economic parameters and are classified in accordance with the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves. The Mineral Reserves are summarized in Table 15-7.

Table 15-7: Ajax Project Mineral Reserves Estimate – NSR Cut-off of US$7.10/t

Confidence Category	ROM (Mt)	Average ROM Grades			Contained Metal		
		Cu (%)	Au (g/t)	Ag (g/t)	Copper (Mlb)	Gold (koz)	Silver (koz)
Proven Mineral Reserves	130	0.30	0.19	0.40	875	791	1,677
Probable Mineral Reserves	296	0.28	0.19	0.38	1,818	1,813	3,615
Proven & Probable Mineral Reserves	**426**	**0.29**	**0.19**	**0.39**	**2,693**	**2,605**	**5,292**

Notes: **1.** CIM Definitions were followed for Mineral Reserves. **2.** Mineral Reserve are estimated at an NSR cut-off of $7.10. **3.** Mineral Reserve are estimated based on long term metal prices of US$3.21/lb Cu, US$1200/oz. Au, and US$17/oz. Ag. **4.** Inferred blocks were included as waste blocks in generating the economic pit shell. **5.** Process recoveries for the six common metallurgical zones are included in the NSR estimation. **6.** Tonnages and grades are rounded to reflect the accuracy of the estimate, and numbers may not sum correctly due to rounding.

15.5 Comments

The Mineral Reserves estimate for the Ajax Project have been based on the Mineral Resources presented in Section 14.0 and appropriately consider modifying factors, have been estimated using industry best practices, and conform to the requirements of the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves.

The potential modifying factors have been adequately accounted for using the assumptions in this report at this engineering level of study, and therefore the Mineral Resources within the mine plan may be converted to Mineral Reserves using the appropriate confidence categories.

16 Mining Methods

The Ajax deposit will be mined as a conventional large scale open pit operation. A truck and shovel fleet will be used to supply ore at a rate of 65,000 t/d to the processing facility over an 18 year mine life (excluding development and pre-stripping). Mining will proceed on 15 m benches and drilling and blasting will be used to fragment the rock mass. Higher grade material will be preferentially targeted for processing early in the mine life to maximize the discounted cash flow. Two stockpiles are planned to be used to balance the production schedule with the required processing rate. Low grade ore stockpiled during the production will be processed at the end of mine life. Horizontal drains are proposed as the primary means to depressurize and stabilize pit walls. In-pit water will be removed by way of ditches, pipes, sumps, pumps, and booster pumps. Five mine rock storage facilities are planned to hold waste rock.

16.1 Phase Designs

The ultimate pit described in Section 15 will be developed through a phased pit strategy. Phasing the pit allows for scheduling to target higher value mining areas earlier in the mine life and defer the lower value mining areas to later years.

16.1.1 Methodology & Design Parameters

The nested pit shells, described in Section 15, were used as guides to design the interim mining phases. Similar to the ultimate pit, the detailed phase designs added bench toe and crest definition, access ramps, and catchment benches to the pit shells. Haul road access between phases, adequate mining width, and availability of pit backfilling were also integral to the phase designs. The designs followed the practical and geotechnical design parameters listed in Sections 15.1.2.5 and 15.2.2.

16.1.2 Operational Phase Designs

The ultimate pit will be developed through a series of seven interim phases. Table 16-1 summarizes the material in each of the interim phases.

Table 16-1: Designed Interim Pit Phase Material Summary

Phase	Total (Mt)	Waste (Mt)	Ore (Mt)	Cu %	Au g/t	Ag g/t
1	62	36	27	0.33	0.21	0.43
2	191	132	58	0.30	0.18	0.37
3	113	74	39	0.26	0.16	0.32
4	252	190	63	0.30	0.17	0.39
5	291	217	73	0.27	0.17	0.37
6	315	237	78	0.28	0.19	0.38
7	333	244	89	0.29	0.24	0.44
Total	**1,556**	**1,130**	**426**	**0.29**	**0.19**	**0.39**

The first two phases focus on the extraction of high grade ore with a low strip ratio in the area of the existing West pit. Phase 3 further expands the existing East pit and takes advantage of a low strip ratio to maintain an uninterrupted ore release during the mining of Phase 2. Phase 3 also allows for development of Phase 4 which combines the existing West and East mining areas into a single pit. Phase 5, 6 and 7 are push backs to the Northeast and advance the pit towards the ultimate pit limits. Pit backfilling can only commence once Phase 6 has reached the maximum depth of the ultimate pit. Phase 6 completes the Western extent of the ultimate pit. Figure 16-1 illustrates a plan view of the interim pit phases from the 870m bench level.

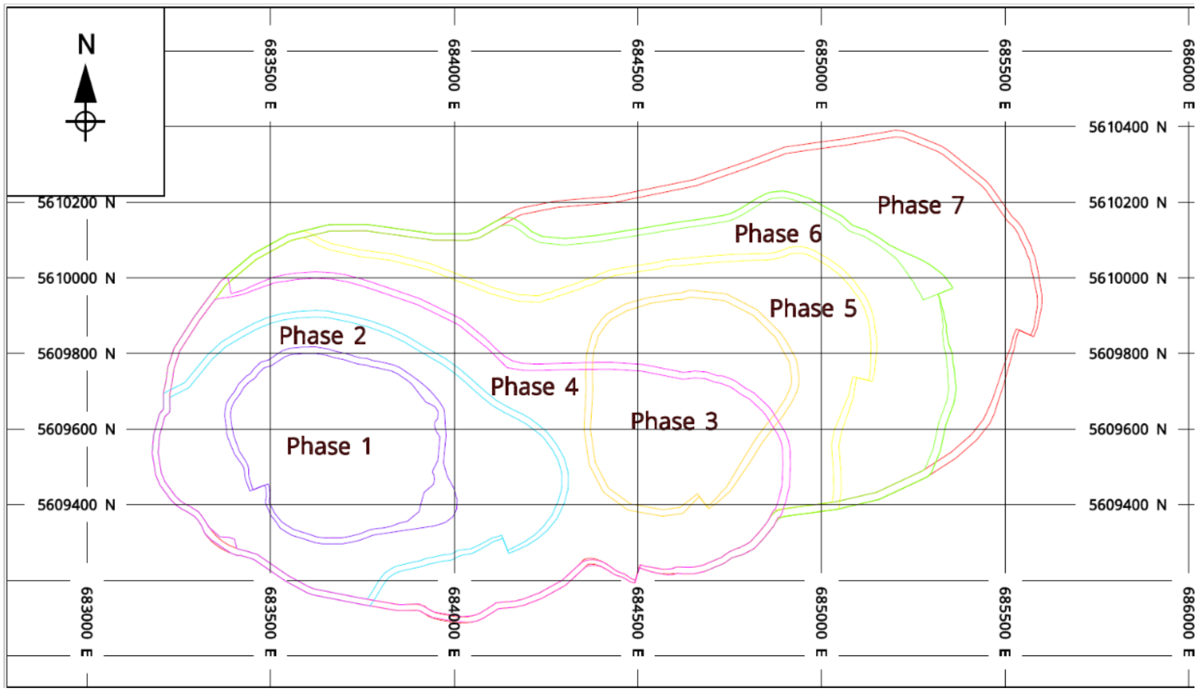


Figure 16-1: Phase Designs in Plan at 870 m Elevation

16.2 Mine Rock Storage

Four mine rock storage facilities (MRSFs) for waste rock are planned for the Ajax Site. The east mine rock storage facility (EMRSF) will be constructed east of the ultimate pit. Similarly the south mine rock storage facility (SMRSF), will be located south of the ultimate pit. The tailings embankment will be constructed in two parts, the north and east sections. A north extension and buttress for the main tailings embankment called the west mine rock storage facility (WMRSF) will be constructed to increase storage capacity, reduce haul costs, and to increase the stability of the TSF Embankment. A backfill storage facility is also planned once Phase 6 of the interim pit phases has been completed. Figure 16-2 illustrates the location of each storage facility.

A low grade (7.10 $/t ≤ NSR < 12 $/t) and medium grade (12 $/t ≤ NSR < 18$/t) stockpile will be used for grade control and allow for mining and processing production scheduling to be smoothed. These stockpiles are located south of the open pit on the existing WMRSF plateau.

In addition to the described ore stockpiles and MRSFs, the Ajax general arrangement site plan (Figure 16-2) contains several temporary reclamation material stockpiles and two permanent stockpiles. The temporary reclamation material stockpiles will hold topsoil and overburden for mine reclamation and closure. The temporary stockpiles will be built within the ultimate pit during the mining of phases 1 through 4 and will be relocated to long-term stockpiles on top of the EMRSF (once it is established) and to the north of the ultimate pit.

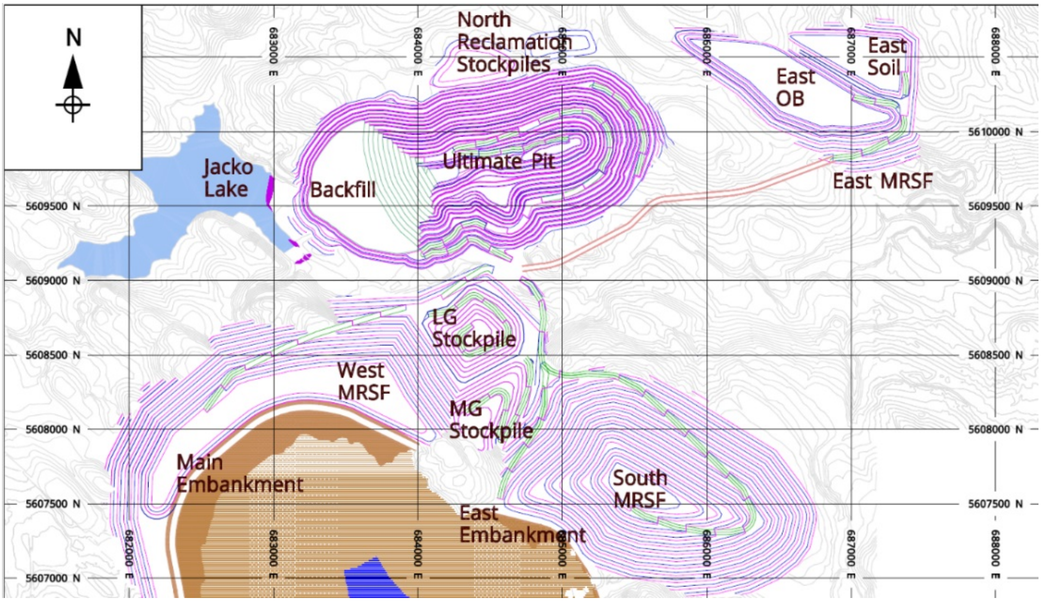


Figure 16-2: Mine Rock Storage Facilities

16.2.1 Stockpile Design Specifications

Mine rock storage facilities, except the in-pit backfill, are designed for a bottom-up construction methodology using the following design parameters:

Lift Height .... 20 m
Dumping Angle 37º
Overall Slope Angle 23º
Rock Swell Factor 30%

The overall slope angle was selected with consideration for reclamation and closure requirements. As part of the upstream tailings seepage and drainage controls, a portion of the tailings embankments will be required to be placed with a 1 m compacted rock fill zone. The design of both the SMRSF and WMRSF has been integrated with the design and construction methodology of the tailings embankments. The construction methodology is outlined in the *Tailings Storage Facility Constructability Report* developed by Norwest Corporation.

Slope parameters for the overburden and topsoil stockpiles are dependent on the foundation material and the height of the slope. The overall designed slope angles are provided in Table 16-2 based on design recommendations from *Norwest Corporation*.

Table 16-2: Slope Design Parameters for Reclamation Stockpiles

Stockpile Material Type	Overall Slope (H:V)
All Temporary Reclamation Stockpiles	3:1
Temporary Ore Stockpiles	2:1
Topsoil On EMRSF	2:1
Overburden On EMRSF	2:1
Permanent Overburden Stockpiles	2.5:1

16.2.1.1 Geotechnical Stability

There are four primary MRSF that will be developed to manage mine rock through the life of mine: the West Mine Rock Storage Facility (WMRSF) will buttress the north embankment and is located southwest of the pit, the South Mine Rock Storage Facility (SMRSF) will buttress the east embankment, which is located southeast of the pit and adjacent to the plant site, and the East Mine Rock Storage Facility (EMRSF) located east of the pit. Additional mine rock storage will also include in-pit backfill located at the west end of the open pit to stabilize this west wall which is adjacent to Jacko Lake. Temporary ore and soil stockpiles will also be developed on site through the life of the project. The MRSF structures and these temporary stockpiles were evaluated to meet design requirements based on the revised Canadian Dam Association Dam Safety Guidelines (CDA, 2013) and the British Columbia Mine Waste Rock Pile Research Committee (BCMWRPRC, 1991). Stability analyses were completed to demonstrate adequate stability of the MRSF and stockpile structures through the life of mine. This included an assessment of the staged MRSF heights, storage capacities, slope angles and foundation conditions. The calculated factors of safety based on limit equilibrium stability analysis exceed design criteria for static and pseudo-static conditions.

16.2.2 Stockpile Storage Capacities

The in-pit backfill facility will be developed in two stages. Placement of the first stage will occur from the pit bottom once Phase 6 has been complete. The second stage of the backfill facility will be constructed utilizing the southern pit rim along the haul road. Following completion of the second stage, the overall height of the backfill will be approximately 390 meters in height. The backfill will be placed in controlled lift heights in the range of 40-50m in order to improve stability and mitigate flowslide risk potential. The development of second stage will be carefully monitored and only progress if wall movement and surface cracks on the dump are not observed.

Design of the mine rock storage facilities resulted in a total waste rock storage capacity of 1,236 Mt shown in Table 16-3.

Table 16-3: Waste Rock Facility Storage Capacities

Storage Facility	Tonnage Capacity (Mt)
East	64
South	489
West	249
North Embankment	166
East Embankment	14
Combined West	429
In-Pit Backfill	254
Total	**1,236**

A small portion (up to 10%) of the Ajax waste rock is expected to be potentially acid generating (PAG). The mine production schedule utilizes a controlled blending strategy of layering to neutralize the PAG with non-potentially generating (NAG) waste rock. The blending strategy is consistent with the methodology proposed in the Ajax project Environmental Assessment Certificate Application for managing PAG waste rock. Test work completed to date has shown strong neutralizing potential of the NAG waste rock in support of the blending strategy. All PAG waste rock storage will be placed in the SMRSF, WMRSF, and backfill storage facilities. A blending target achieves a minimum Neutralizing Potential / Acid Generating Potential (NPR) Ratio of 3:1.

16.3 Production Schedule

The mine production schedule is based on supplying the processing facility with ore at a rate of 65,000 t/d during an 18 year mine life. The objective of the mine plan is to maximize the discounted cash flow by prioritizing higher value ore (high grade ore and low waste strip) for processing while deferring lower value ore (lower grade ore and higher waste strip).

16.3.1 Scheduling Methodology & Constraints

To maximize the discounted cash flow, the lower grade material will be stockpiled throughout the mine life and only processed at the end of the mine life. Two stockpiles will be available to store the lower grade material. Stockpiled material will be separated by grade to prioritize the highest grade materials being processed first. Periodically, material will be required from the stockpiles to supplement the mill feed due to fluctuations in availability of run-of-mine to mill feed.

The mine plan was developed monthly from initial development (Year -2) through the end of Year 1, quarterly for the next two years (Year 2 and 3), and then annually for the remaining mine life.

A 6 month mill ramp-up was estimated and incorporated into the mine production schedule. Table 16-4 summarizes the estimated mill ramp-up period which was developed by the KGHM Ajax mineral processing group.

Table 16-4: Mill Ramp-Up

Month	% Of Nameplate[1] Throughput
1	15%
2	33%
3	51%
4	66%
5	86%
6	100%

Note: [1] Nameplate throughput = 65,000 tpd

The following assumed operational constraints were also applied in the mine production schedule:

- Minimum equipment operating width of 100 m
- Maximum annual vertical advance rate of 8 single benches per phase
- Maximum of two open benches per mining phase
- Maximum of 3 active phases in full production in any period
- Tailings embankment construction schedule a priority for waste placement
- NPR blending target (NPR >3:1) for PAG storage facilities

16.3.2 Mine Production Schedule

Mining begins with development of the high grade and near surface mineralization found in Phase 1, which is a pushback of the existing west pit. As Phase 1 progresses, the mining fleet begins development of a second pushback (Phase 2) in the west pit area. Stripping of Phase 3, in the existing east pit area, begins during mill commissioning and this additional ore supplements Phase 2 until it reaches sustainable ore release. The remaining phases connect the two areas and sequentially continue to push back to the ultimate pit maintaining a balance between the waste stripping and ore requirements. Table 16-5 shows the sequencing of the pit phases.

Table 16-5: Pit Phase Sequencing

	PP		Production Year																	
Phase	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Phase 1	■	■	■	■																
Phase 2		■	■	■	■	■														
Phase 3			■	■	■															
Phase 4				■	■	■	■	■	■											
Phase 5							■	■	■	■	■	■	■	■						
Phase 6									■	■	■	■	■	■	■					
Phase 7													■	■	■	■	■	■	■	
Stockpiles																				■

Note: PP = pre-production; Stockpiles = pit is complete and low grade stockpiles are processed in final year.

The waste rock extracted during the pre-production phase is scheduled for road construction, tailings embankment development and the WMRSF. After plant commissioning, the development of the SMRSF and EMRSF begins. The SMRSF is initially developed at a slower rate to maintain a NPR above 3 and to account for the time required to build the storage facility on the present terrain. The EMRSF is prioritized in the early years because this facility will form the platform for the reclamation stockpiles and the sooner the facility can be established the less rehandling of soil and overburden will be required.

The production schedule has been smoothed to avoid large fluctuations of the required mining equipment. Table 16-6 and Table 16-7 summarize the life-of-mine production schedule and mill feed schedule, respectively.

Table 16-6: Life-of-Mine Production Schedule

Year	Waste (kt)	ROM Ore To Mill (kt)	ROM Ore To Stockpile (kt)	Total ROM (kt)	Re-handle Ore (kt)	Overburden Re-handle (kt)	Total Moved (kt)
-2	11,481	0	278	11,759	0	0	11,759
-1	31,685	5,500	1,781	38,966	1.440	0	40,406
1	66,111	20,692	3,620	90,422	3.033	0	93,456
2	79,676	22,907	6,486	109,070	818	0	109,888
3	63,996	23,606	18,474	106,076	119	7,300	113,495
4	86,509	16,736	6,302	109,547	6,989	5,234	121,769
5	73,788	14,276	3,063	91,127	9,449	2,000	102,577
6	68,775	21,552	4,307	94,634	2,173	3,500	100,307
7	83,672	23,725	110	107,507	0	0	107,507
8	83,520	23,702	792	108,015	23	0	108,037
9	83,949	22,945	0	106,894	780	0	107,674
10	71,394	23,718	2,529	97,641	7	0	97,674
11	72,608	23,725	2,310	98,643	0	0	98,643
12	64,299	23,725	4,290	92,314	0	0	92,314
13	59,387	19,916	0	79,303	3,809	0	83,112
14	70,918	9,073	10	80,000	14,653	0	94,653
15	43,068	23,712	11,131	77,910	14	0	77,924
16	9,878	23,014	1,213	34,104	711	0	34,816
17	5,443	17,075	0	22,518	6,650	0	29,168
18	0	0	0	0	16,028	0	16,028
Total	**1,130,156**	**359,598**	**66,695**	**1,566,449**	**66,695**	**18,034**	**1,641,178**

Note: ROM = run of mine; kt = thousand tonnes

Table 16-7: Mill Feed Schedule

Year	Mill Feed (kt)	Cu (%)	Au (g/t)	Ag (g/t)
-1	6,940	0.28	0.17	0.36
1	23,725	0.32	0.21	0.42
2	23,725	0.30	0.17	0.36
3	23,725	0.34	0.21	0.43
4	23,725	0.31	0.18	0.38
5	23,725	0.27	0.15	0.35
6	23,725	0.30	0.20	0.39
7	23,725	0.30	0.19	0.40
8	23,725	0.28	0.16	0.36
9	23,725	0.28	0.16	0.37
10	23,725	0.29	0.21	0.42
11	23,725	0.30	0.20	0.40
12	23,725	0.29	0.19	0.38
13	23,725	0.29	0.19	0.42
14	23,725	0.18	0.12	0.25
15	23,725	0.34	0.28	0.49
16	23,725	0.30	0.25	0.45
17	23,725	0.30	0.25	0.47
18	16,028	0.13	0.08	0.18
Total	**426,293**	**0.29**	**0.19**	**0.39**

16.4 Mining Operations

16.4.1 Pioneering & Site Development

The terrain at the Ajax deposit does not require special preparation for mine development. Initial pioneering and pit development during the pre-production period will be accomplished with a hydraulic shovel, front-end-loader (FEL), dozers, percussion drills, and rear end dump trucks. To prepare the site, overburden will be removed, mine access roads suitable for large mining equipment will be developed, and the initial pit working faces will be established. A working face of 15 meters will be used to allow for the large production shovel and mining equipment, mine rock storage areas will be established, and run-of-mine rock delivered for the tailings embankment construction.

Organic material will be stripped from pit areas and mine rock storage facilities foundations, as outlined by KAM environmental and geotechnical personnel. Pre-stripping will be accomplished by pushing down the topsoil material to centralized staging areas where the loader and truck fleet will load and haul the material to the temporary stockpile locations. Suitable organic material will be stockpiled for future reclamation at the in-pit temporary stockpile location and will be relocated to the EMRSF once it has been built. Drilling and blasting may be required to provide level working platforms once the overburden has been removed.

16.4.2 Drilling & Blasting

Blasthole drilling will be performed with nominal 311 mm (12 1/4") diameter rotary production drills. Blastholes adjacent to Jacko Lake will be reduced in size to 152 mm (6") diameter to reduce the vibration effects caused by blasting on fish habitat. Ore and waste zones will be drilled in a single pass with nominal 16.5 m deep holes (15 m plus 1.5 m sub grade).

Four blasting zones (shown in Figure 16-3) have been identified to mitigate blast vibration on Jacko Lake fish habitats. Each zone contains specified blasting parameters in order to reduce charge weights as blasting operations approach Jacko Lake. Table 16-8 summarizes the drill and blast parameters for each zone.

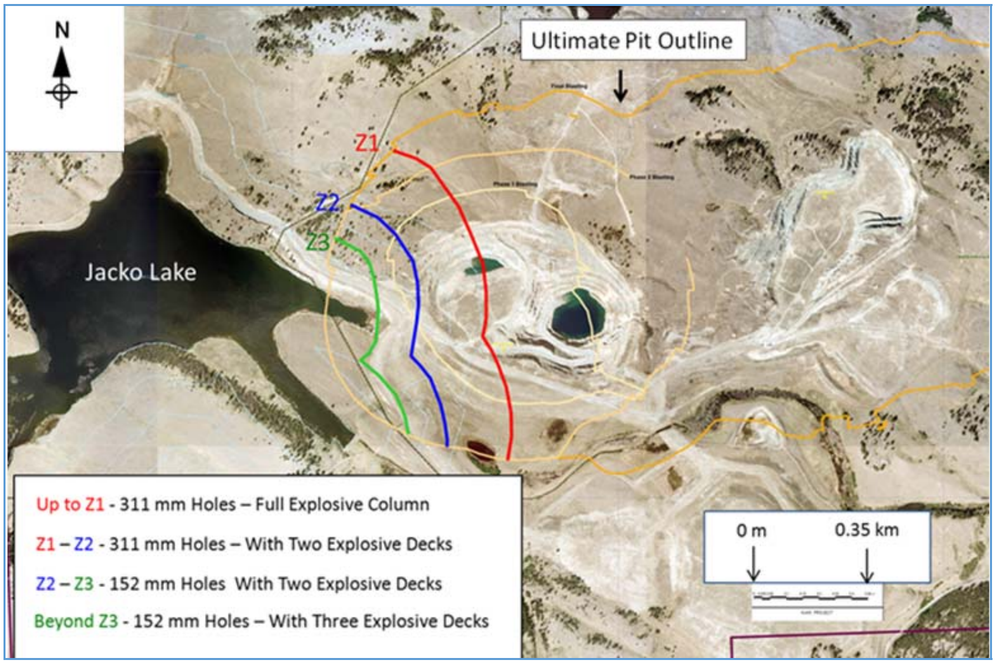


Figure 16-3: Unique Blast Zones Adjacent to Jacko Lake

Table 16-8: Drill & Blast Parameters

	Up To Z1		Z1 to Z2		Z2 to Z3		Beyond Z3	
	Ore	Waste	Ore	Waste	Ore	Waste	Ore	Waste
Burden (m)	9	9.5	8	10	4	5.2	4.2	4.8
Spacing (m)	9	9.5	8	10	4	5.2	4.2	4.8
Collar (m)	6	6	6	6	2.8	2.8	2.8	2.8
Subgrade (m)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Deck Separation (m)	0	0	3.3	3.3	2.3	2.3	4.6	4.6
Hole Diameter (mm)	311	311	311	311	152	152	152	152
Rock Tonnes Per Hole (t)	3,451	4,197	2,726	4,650	682	1,257	751	1,071
Explosives Per Hole (kg)	957	957	656	656	248	248	198	198
Stem Charge (kg)	64	0	64	64	0	0	0	0
Total Explosives Per Hole (kg)	1,021	957	720	720	248	248	198	198
Powder Factor (kg/t)	0.30	0.23	0.26	0.16	0.36	0.20	0.26	0.18

Waste material will be blasted to produce a suitable particle size distribution for loading and hauling. Mineralized material will be blasted to comply with the process plant fragmentation and particle distribution requirements.

A blend of ammonium nitrate/fuel oil (ANFO) and emulsion explosives will be used for production blasts. The explosives manufacturing facility will be built by an explosives contractor and will be designed to meet the Canadian regulations to manufacture and securely store the blasting materials and equipment safely. The explosives contractor will supply the mixed explosives products down the hole while the tie-in and blasting function will be carried out by the Ajax personnel.

A wall control program consisting of pre-splitting and buffer blasts will be carried out along all final pit walls and intermediate phase walls. This wall control pattern will include a four-row buffer blast (2 buffer rows and 2 production rows) and a pre-shear row. Table 16-9 outlines the wall control drill and blast parameters.

Table 16-9: Wall Control Drill & Blast Parameters

	Pre-Shear	Buffer Row 1	Buffer Row 2	Production Row 1 & 2
Burden (m)	-	4.5	6.75	9.5
Spacing (m)	2	4.5	6.75	9.5
Collar (m)	1.5	5	6	6
Subgrade (m)	1	0	1.5	1.5
Hole Diameter (mm)	152	152	311	311
Rock Tonnes Per Hole (t)	-	942	2,117	4,197
Explosives Per Hole (kg)	30.4	218	957	957
Powder Factor (kg/t)	-	0.23	0.45	0.23

16.4.3 Loading & Hauling

Primary loading of waste and ore will be done by electric rope shovels with a nominal 56 m^3 bucket. Diesel front-end loader (FEL) with a nominal 25 m^3 bucket and a diesel hydraulic shovel with a nominal 27 m^3 bucket will be used to develop the initial benches and to supplement the electric rope shovels when needed. Both the FEL and diesel hydraulic shovel will also be used to reclaim stockpiles.

All loading units can be assigned to operate in both ore and waste. This will increase flexibility of the production plan, allowing operations to effectively work in multiple mining areas. The loading units will be equipped with a global positioning system (GPS) to allow for real-time updates on their positions and relation to ore/waste contacts.

Large rear-end dump haul trucks (300 t class) will be used for hauling both ore and waste to the correct dump destinations. GPS will be installed on the trucks to allow dispatch to monitor the trucks location and system diagnostics. This will allow for reconciliation of material placement and assist maintenance to effectively maintain the truck fleet.

16.4.4 Production Support & Ancillary Equipment

A fleet of track dozers, small front-end loaders, graders, and water trucks will support the main production equipment. This fleet will be responsible for road construction and maintenance, pit floor maintenance, spill rock clean-up, and rock storage facility development and reclamation, among other duties.

A fleet of ancillary mobile equipment, for example cable reelers, fuel/lube trucks, excavators, light vehicles, cranes, and utility vehicles, and other units have been included in the overall equipment requirements estimate.

16.4.5 Water Management

A water management plan has been developed by KAM and can be found in the *Ajax Environmental Assessment Certificate Application*. The mine drainage and dewatering system is designed to perform the following tasks:

- drain water and prevent water pressures from building up behind the pit walls
- control surface water and runoff that enters the pit
- capture precipitation and drain it away from road running surfaces and active mining areas
- remove surface water that collects in sumps.

Horizontal drain holes (HDH) will be the primary means of pit wall depressurization as determined by BGC Engineering. Precipitation, seepage from walls, and horizontal drains will introduce water into the pit. Some of this water will be absorbed by the broken rock and hauled with the rock out of the pit. A coordinated network of ditches and sumps will be developed within the mining areas and along haul roads to direct and collect water inflows. Water will be collected in temporary in-pit sumps established on each bench allowing for partial settling of solids before being pumped to ex-pit sumps. Water will be pumped between the in-pit and ex-pit sumps using a suitably sized pump and piping network system. The pit dewatering system is designed to handle a two-year return period rain storm. Rain events in excess of this will cause the lower areas of the pit to flood. During these rare events, mining will be focused on the upper mining phases until the water is pumped out from the lower elevations.

Details of the water management plan can be found in Section 18.

16.4.6 Ore Grade Control

In order to achieve the estimated mining recovery (2% mining loss), and reduce the amount of dilution mining operations will require the ability to accurately distinguish between the different ore mining areas separated by cut-off value and accurately predict the actual waste to mineralized material contact.

Ore grade control will be achieved through:

- Sampling, and geologic mapping of blastholes
- Using 3D software to incorporate the assay data with blasthole coordinates
- Generating short-range planning block models
- Performing ore and waste delineation and supplying this information to the loading units
- Performing mine to mill reconciliations and quality control.

Ore control will rely heavily on digital methods such as high-precision GPS and virtual maps because the ore zones are not visually discernible by field personnel. Dark and snowy conditions will also add to the reliance on digital techniques.

Errors in mis-labelling drillhole assays, incorrect or missing survey data, and other problems with software and hardware could affect the ore control and increase the mining ore loss which is a risk to the economics of the project.

16.4.7 Supervision & General Mine Support

Three management groups will oversee all mine operations activities: mine operations, mine maintenance, and technical services. The responsibility of these groups will be to optimize mining plans, execute the life of mine plans, and maintain production equipment in a safe and environmentally responsible manner.

16.4.8 Reclamation & Closure

Concurrent reclamation of the MRSFs will take place as much as possible during the mining operation. Reclamation will involve re-contouring of the dump slopes to ensure geotechnical stability of the facilities meets regulatory requirements and spreading of overburden and topsoil over of the slopes followed by seeding and mulching to establish vegetation growth. The open pit will gradually fill with water over time based on modeling estimates completed for the site.

Details of the reclamation and closure can be found in Section 20.

16.5 Mine Equipment Requirements Estimate

Mine equipment requirements are estimated through first principle calculations based on equipment hour definitions, productivity estimates, and the mine production schedule. Table 16-10 summarizes the life-of-mine equipment requirements.

Table 16-10: Life-of-Mine Equipment Requirements Estimate

		PP			Production																	
Year	**Class**	**-3**	**-2**	**-1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Rope Shovel	56 m^3 (73 yd)	0	0	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	1	1
FEL (Production)	25 m^3 (33 yd)	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hydraulic Shovel	27 m^3 (35 yd)	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Haul Truck	300 tonne (330 ton)	0	3	9	17	22	21	21	22	22	24	27	27	28	28	28	27	14	15	9	8	2
Electric Drill	311 mm (12 ¼")	0	1	1	2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	1	1	0
Diesel Drill	152 mm (6")	0	2	2	3	3	2	2	1	1	2	2	2	1	1	1	1	1	1	1	1	0
Track Dozer	470/670 kW (630/900 HP)	2	4	5	5	6	6	7	7	7	7	7	7	7	7	7	7	6	5	3	3	3
Grader	4.9m Blade (16' Blade)	0	1	3	3	3	3	3	4	4	4	4	4	4	4	4	3	3	3	2	2	1
FEL (Support)	5-10 m^3 (7-13 yd)	0	0	1	2	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1
Water Truck	75k Liter (20k gallon)	1	1	2	3	3	3	3	4	4	4	4	4	4	4	4	4	3	3	2	1	1

Note: PP = pre-production

A modified equipment hour model was used for the loading and hauling fleet to maximize equipment utilization. This model assumes the loading and hauling fleet stays in production during operator breaks. In order to achieve this assumption additional operators on standby will need to rotate (“hot change”) with permanent operators during scheduled breaks. This effectively allows the equipment to remain in production with less downtime. One operator rotation is required for each loading and hauling unit for the duration of an operator break in the course of each shift. To achieve this operating philosophy, additional operator hours have been added to the labour estimate. Having higher equipment availability has a net effect of slightly reducing the fleet requirements in some years and could pose a risk to the economics of the project if the production schedule is not met due to lack of available equipment. The described continuous “hot change” methodology is unconventional in North America but is utilized in other parts of the world.

16.6 Mine Labour Requirements

Hourly and staff mine labour requirements vary during the mine life. Variations generally reflect the equipment requirements and mine production levels. Table 16-11 summarizes the required manpower levels. A maximum of 362 mine personnel are required in the peak years of production.

Table 16-11: Life-of-Mine Mining Personnel Labour Requirements

Year	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Mine Operations (#)																					
Drilling	2	11	12	17	20	20	20	12	16	20	20	20	16	16	12	12	12	12	8	6	0
Blasting	1	2	2	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	2	2	0
Loading	0	2	10	16	20	20	20	20	20	20	20	20	20	20	20	20	20	16	12	12	12
Hauling	1	9	23	56	83	83	84	88	88	96	108	108	112	112	112	108	56	60	36	32	8
Support	6	19	34	45	53	53	56	61	61	61	61	61	61	61	61	58	49	45	28	26	18
Mine General	1	2	4	8	16	16	16	16	16	16	16	16	16	16	16	16	16	12	6	3	1
Subtotal Mine Operations	10	45	85	146	198	198	202	203	207	219	231	231	231	231	227	220	159	151	92	81	39
Mine Maintenance (#)																					
Drilling	0	1	1	2	3	4	4	4	4	4	4	4	4	3	3	3	3	3	2	1	0
Blasting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loading	0	1	3	6	8	8	6	6	6	6	6	6	6	6	6	6	6	4	2	2	4
Hauling	1	2	5	11	20	20	20	20	20	22	26	26	26	26	26	26	16	16	10	10	3
Support	1	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6	5	4	3	2	2
Mine General	2	5	12	20	34	36	36	36	36	36	36	36	36	36	33	30	24	19	9	9	6
Subtotal Mine Maintenance	3	12	25	44	71	74	72	72	72	74	78	78	78	77	74	71	54	46	26	24	15
Mine General (#)																					
Staff	12	24	34	46	53	53	53	53	53	53	53	53	53	53	53	53	53	50	30	23	9
Total Mine (#)	25	80	144	235	321	325	327	328	332	346	362	362	362	361	354	344	266	247	148	128	63

17 Recovery Methods

17.1 Introduction

The Ajax process plant is designed to treat 23,725,000 dry tonnes of a copper-gold ore annually, or 65,000 t/d, producing approximately 250,000 dry tonnes of concentrate per year grading 25% Cu and containing approximately 14.65 g/t Au.

The ore processing scheme is based on the results of the metallurgical testwork program described in Section 13. A simplified process flow diagram is shown in Figure 17-1. A detailed mass and water balance and a detailed process design criteria have also been developed for the process and used as a basis for equipment selection and sizing.

Run-of-mine (ROM) ore will be delivered to the primary, gyratory crusher by mine haul trucks and fed directly to the dump pocket. Crushed ore from the primary crusher is conveyed to the covered coarse ore stockpile, which will provide surge capacity between the primary crusher and subsequent crushing stages. Ore will be withdrawn from the stockpile by feeders, located in a tunnel under the stockpile, then conveyed to two further stages of crushing and screening. These two stages, employing cone crushers in the secondary application and high-pressure grinding rolls (HPGR) in the tertiary, will reduce the ore size down to an 80% passing size of 3.25 mm. A fine ore stockpile will be provided between the secondary and tertiary crushing stages providing additional surge capacity.

Undersize product from the HPGR screen discharges to the ball mill circuit. Full plant flow is treated in two ball mills operating in closed circuit with two dedicated sets of cyclone-clusters producing a flotation feed with an 80% passing size of 214 µm.

Froth flotation will be used to produce a concentrate containing primarily chalcopyrite. Rougher concentrate will be reground in two stages to approximately 80% passing size of 20 µm and subjected to three stages of cleaner flotation to upgrade the copper content of the concentrate. The copper concentrate will be dewatered by thickening and filtration steps before being placed in a concentrate stockpile. A front-end loader will be used to reclaim concentrate and transfer the material to concentrate trucks for shipment to the Port of Vancouver.

A portion of the primary regrind cyclone underflow will be processed through a gravity circuit to maximize the recovery of fine gravity gold. Concentrate from this circuit is to be combined with the copper concentrate at the concentrate thickener.

Final flotation tailings will be disposed of using thickened tailings slurry deposition into a tailing storage facility. This will allow for greater control of water management. Process water will be recycled from the tailings thickener overflow and will be supplemented with process water recovered from both tailings storage facility and the overflow of the concentrate thickener. Fresh water will be used for pump gland seal service, reagent preparation, gravity concentrator fluidization, and process water makeup.

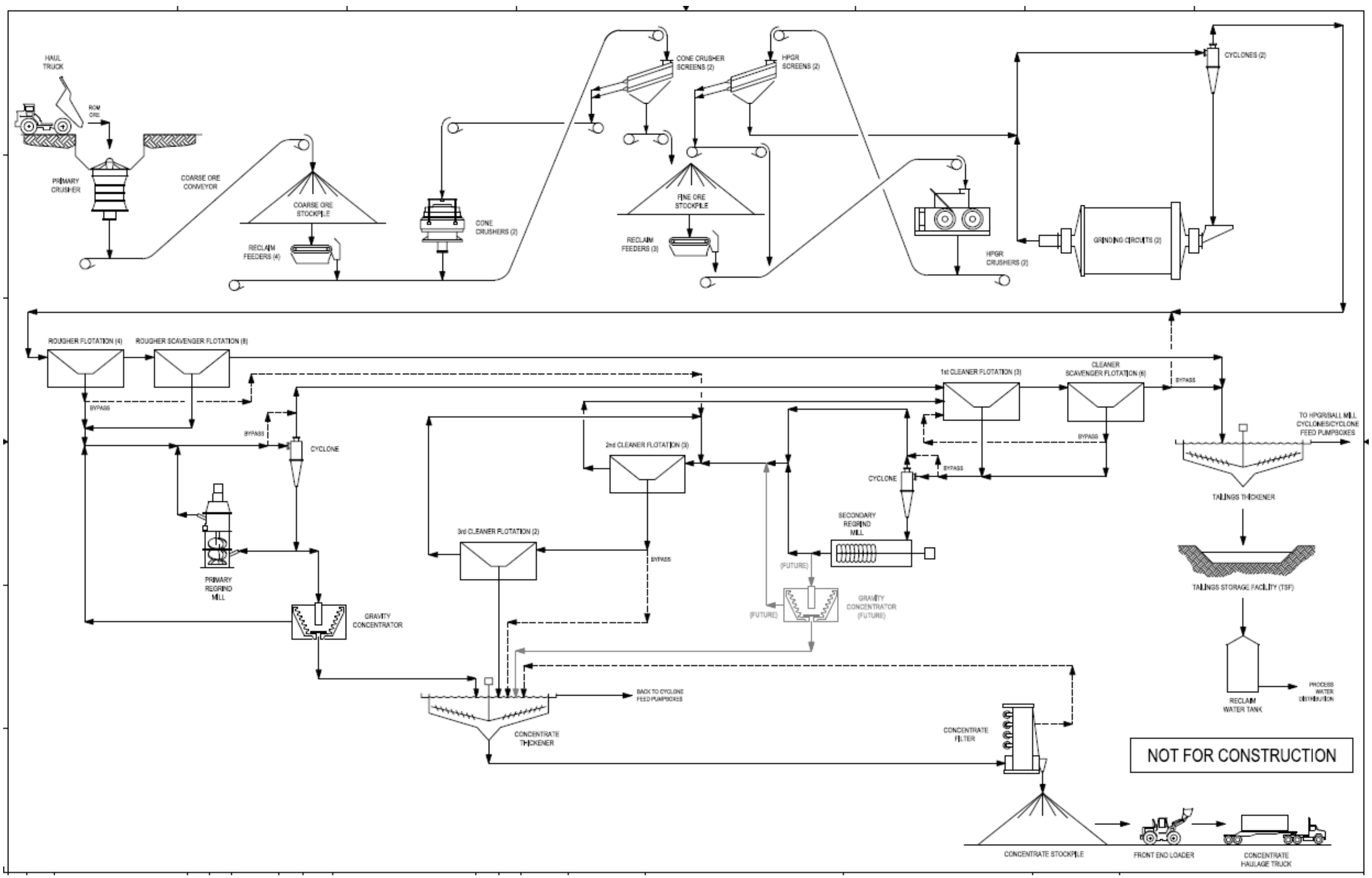


Figure 17-1: Simplified Process Flow Schematic

17.2 Major Design Criteria

The Ajax process plant is designed to treat 23,725,000 tonnes of a copper-gold ore annually to produce a saleable copper concentrate. The ore processing scheme will include the following operations:

- ROM ore receiving and primary crushing
- Covered coarse ore stockpile
- Coarse ore stockpile reclaim
- Secondary crushing circuit incorporating cone crushers
- Covered fine ore stockpile
- Fine ore stockpile reclaim
- Tertiary crushing circuit incorporating HPGRs
- Ball mill grinding circuit incorporating cyclones for classification
- Rougher and scavenger flotation
- Primary regrind
- Gravity gold concentration
- First cleaner and cleaner scavenger flotation
- Secondary regrind
- Second and third cleaner flotation
- Copper concentrate dewatering circuit
- Final tailings thickening, pumping and water recycle.

The process design, as shown on the simplified flowsheet (Figure 17-1), is the result of the metallurgical testing program described in Section 13.

Major design criteria are summarized in Table 17-1.

HPGR design criteria reflect the testwork conducted by Krupp Polysius.

The grinding mills were sized based on the Bond Work Index data for ball mills. The primary regrind mill was also sized based on Bond Work Index data as well. The secondary regrind mill was sized based on the Signature test data from laboratory testwork and confirmed by the supplier.

Flotation cells were sized based on the optimum flotation times as determined during the latest bench and pilot scale test campaigns. Typical flotation cell design parameters and scale-up factors have been used in the design of the flotation circuit.

Table 17-1: Major Design Criteria

Item	Units	Value
Ore Characteristics		
Copper grade	%	0.3
Gold grade	g/t	0.2
Ore density	kg/m^3	2,790
Crushing work index (average)	-	8.57
HPGR index	-	2.92
Ball mill work index (Bond - average)	-	23.59
SMC (A x b)	-	34.47
Abrasion Index	-	0.24
Crushing		
Design throughput	dmt/y	23,725,000
Feed Size, F_{80}	mm	745
Product size, P_{80}	mm	3.25
Primary Crushing		
Availability	%	70
Nominal capacity	dmt/h	3,869
Secondary crushing		
Availability	%	85
Nominal capacity	dmt/h	3,186
Tertiary Crushing		
Availability	%	92
Nominal capacity	dmt/h	2,944
Milling & Concentration		
Availability	%	92
Nominal capacity	dmt/h	2,944
Primary grinding circuit product, P_{80}	um	214
Regrind circuit product, P_{80}	um	40
Metallurgical Performance		
Overall copper recovery	%	85.9
Overall gold recovery	%	85.1

17.3 Process Flowsheet Description

17.3.1 ROM Ore Receiving & Primary Crushing

The ROM ore receiving and primary crushing processes are shown on process flow diagram. Equipment details are reported in the mechanical equipment list.

ROM ore will be delivered to the primary crusher in 300 tonne haul trucks. Ore will be dumped directly into the 450 tonne capacity covered dump pocket that allows for a two-truck approach at the dump pocket. Large rocks, not passing the 1,500 mm by 2,800 mm (60” by 110”) primary gyratory crusher, will be broken with the permanently installed hydraulic rock breaker.

Dust generated by the dumping and rock breaking operations will be contained inside the dump pocket dust enclosure and collected by a dust hood positioned at the roof. Exhaust fans will extract the dust and duct the dust lade air to the primary crusher dump area dust collector before venting the air to atmosphere. Dust captured by this collector is returned to the coarse ore stockpile feed conveyor.

An apron feeder, equipped with a variable frequency drive, situated below the primary crusher surge pocket will draw crushed ore (P_{80} = 150 mm) and transfer the crushed material to the coarse ore stockpile feed conveyor which in turn transfer the ore to the coarse ore stockpile.

A dry dust collection system will control dust emissions from the primary crusher plant. Exhaust hoods are provided at drop points to control fugitive emissions and chemical suppression systems are included at locations where captured dust collector fines are reintroduced into the process.

Crusher performance will be monitored by a particle size camera located on the stockpile feed conveyor.

17.3.2 Covered Coarse Ore Stockpile & Reclaim

The covered coarse ore stockpile and reclaim processes are shown on process flow diagram. Equipment details are reported in the mechanical equipment list.

The coarse ore stockpile is a production surge facility that will allow for steady uninterrupted feed to the secondary crushing and screening circuit. Any temporary slowdown, stoppages or production surges of the primary crushing and conveying system will be absorbed by the stockpile and not affect the downstream secondary circuit.

The covered stockpile feed conveyor will transport crushed ore to the covered coarse ore stockpile. Ore will drop into the centre of the covered pile forming a conical stockpile above the reclaim system. The resulting cone will have a live capacity of 40,000 tonnes (200,000 tonnes total capacity).

Coarse ore will be reclaimed from the stockpile by four apron feeders, each equipped with a variable frequency drive, located in a tunnel under the stockpile. The apron feeders will discharge to the first cone crusher screen feed conveyor for transport to the secondary crushing circuit. The feeders will be sized to allow two feeders to accommodate the full production rate, however all four feeders can be operated simultaneously to maintain a uniform plant feed and to draw down the stockpile evenly.

A weightometer will be installed on the first cone crusher feed conveyor for process control and metallurgical accounting. A belt magnet will be installed on the belt to protect the cone crushers from damage by tramp metal. Additionally a feed particle size camera will monitor the material on the first cone crusher screen feed conveyor.

A dry dust collection system will control dust emissions from the reclaim tunnel. Collection hoods are located at the discharge points of each apron feeder and a negative pressure is maintained by the exhaust fan on the areas dust collector. Fines captured by the collector are returned to the first cone crusher screen feed conveyor. A local chemical suppression system will help limit any re-entrainment of dust at the addition point.

17.3.3 Secondary Crushing

The secondary crushing process is summarized below.

Coarse ore is transferred from cone crusher screen feed conveyor number one to cone crusher screen feed conveyor number two which discharges to a feed bin at the head of the cone crusher screening circuit. The bin has a live capacity of 360 tonnes, providing approximately 3.5 minutes of live storage in front of the screening plant. Individual belt feeders draw off each of the two discharge points on the bin and feed a 4.2 m by 8.5 m double-deck, vibrating screen. Screen oversize (nominally + 50 mm) is conveyed to the cone crusher feed bin. The bin has a live capacity of 175 tonnes. Screen undersize discharges to the fine ore stockpile feed conveyor.

The cone crusher feed conveyor will be equipped with a feed metal detector to protect the cone crushers. Any metal detected will activate the cone crusher feed diverter chute and material will be diverted to an outside bunker. A belt scale and particle size camera will monitor material on the belt generating data for both process control and metallurgical accounting.

Material will be drawn from the cone crusher feed bin by two belt feeders, each equipped with variable frequency drives, and coarse ore will be delivered to the two 900 kW MP1250 cone crushers. Feed will be controlled to the crusher to ensure a choke-fed situation is maintained.

Secondary crushed material is returned to the head of the screening circuit.

Each area, the cone crusher building and the cone crusher screening area, will have a dedicated dry dust collection system to help control ambient dust levels in each facility. Extraction hoods are located at transfer points and a negative pressure is maintained by the dust collector fans in each area. Dust from the cone crusher area dust collector and from the cone crusher screen area is returned to the HPGR screen feed conveyor and the fine ore stockpile feed conveyor respectively. Local chemical suppression system will help limit any re-entrainment of dust at the addition points.

17.3.4 Covered Fine Ore Stockpile & Reclaim

The covered fine ore stockpile and reclaim processes are summarized as follows.

Cone crusher screen undersized material will discharge onto the feed conveyor, which subsequently discharges onto the covered fine ore stockpile. Ore will drop into the centre of the covered pile forming a 32 meter high conical stockpile above the reclaim system. The resulting cone will have a live capacity of 20,000 tonnes (100,000 tonnes total capacity).

Fine ore will be reclaimed from the covered stockpile by three apron feeders, each equipped with a 75 kW variable frequency drive, located in a tunnel under the stockpile. The apron feeders will discharge to the HPGR feed bin conveyor and be transported to the tertiary crushing circuit. The feeders will be fitted with discharge and dribble chutes to direct the reclaimed material onto the conveyor below. The feeders will be sized to allow two feeders to accommodate the full production rate, however all three feeders can be operated simultaneously to maintain a uniform plant feed and to draw down the stockpile evenly.

A weightometer will be installed on the HPGR feed bin conveyor for process control and metallurgical accounting purposes. A belt magnet will be installed on the belt to protect the downstream equipment from damage by tramp metal and a particle size camera will monitor the material on the HPGR feed bin conveyor.

A dry dust collection system will control dust emissions from the reclaim tunnel. Collection hoods are located at the discharge points of each apron feeder and a negative pressure is maintained by the exhaust fan on the areas dust collector. Fines captured by the collector are returned to the first cone crusher feed conveyor. A local chemical suppression system will help limit any re-entrainment of dust at the addition point.

The atmosphere inside the covered stockpile and inside the tunnel will be swept with clean air by ventilation fans.

17.3.5 Tertiary Crushing

The tertiary crushing circuit processes are summarized as follows.

The tertiary crushing circuit will consist of two HPGR units and two HPGR screens in a closed circuit configuration and will crush material to a particle size acceptable to the grinding and flotation circuit.

Reclaimed material from the fine ore reclaim apron feeders will be received and conveyed to the HPGR feed bin. In addition to delivering fresh feed from the fine ore stockpile to the HPGR feed bin, it will receive recycled feed (oversize particles) for additional tertiary crushing from the HPGR wet screens. The HPGR feed belt scale and particle size camera will provide material throughput data to operations and closed-circuit viewing capability. The self-cleaning cross belt HPGR feed belt magnet positioned just after the conveyor exit from the reclaim tunnel will remove tramp metal from the system.

In order to mitigate the effects of freezing the 360 tonne HPGR feed bin will have steep tapered walls, be of mass flow design (i.e., no dead material) and will be located inside the secondary and tertiary crushing building to ensure the bin surface area is heated. Twenty-five millimetre thick liners will line the inner walls of the bin.

Two variable speed driven HPGR belt feeders will be placed side by side under the bin. The belt feeder will have an intermediary belt conveyor between it and the HPGR. This HPGR feed conveyor will allow placement of a metal detector and head end diverter gate combination to automatically bypass any tramp metal around the HPGR and eliminate potential damage to the expensive rolls. Bypassed tramp metal will detour through the bypass chute and be loaded onto the HPGR screen feed conveyor along with the tertiary crushed material.

Two 2.4 m diameter roll class HPGRs will receive the F_{80} of 45 mm fine ore feed and reduce it to a P_{80} of 15 mm. A level sensor above each HPGR will control the HPGR belt feeder rate to ensure the HPGR is choke fed. A discharge chute under each opening will receive the HPGR discharge and direct it onto the HPGR screen feed conveyor for classification by the screening system.

Dust generated by the tertiary crushing and material transfer operations will be contained and ducted to the HPGR area dust collector located outside. Fines captured by the collector are returned to the HPGR screen feed conveyor. A local chemical suppression system will help limit any re-entrainment of dust at the addition point.

Tertiary crushed ore from the HPGRs is conveyed out of the tertiary crusher building to the 360 tonne HPGR screen feed bin. A weightometer (the HPGR screen feed belt scale) and particle size analyzer will provide material throughput data to the PCS along with closed circuit viewing capability.

Two openings under the bins will facilitate drawdown by the two HPGR screen belt feeders that regulate feed into the HPGR screens.

Two HPGR screens will separate particles that require further tertiary crushing from particles that can pass through to the cyclone feed pump box for process in the grinding and flotation circuit. The screens will be double deck multi-slope screens receiving regulated feed from the HPGR screen belt feeders. Water sprays will be placed over the vibrating decks to aid separation of the passable fines from the oversized particles. No screen dust enclosures or dust collectors will be required due to the natural dust suppression from the sprays.

Undersize particles will drop through the 7 mm wide screen apertures into the cyclone feed pumpbox. Oversized particles from the screens will be first transferred to the HPGR screen oversize transfer conveyor, which in turn transfers over to the HPGR screen oversize return conveyor. This HPGR screen oversize return conveyor will return the recycled feedback on top of the fresh feed of the HPGR feed bin conveyor coming out from the fine ore reclaim tunnel and complete the closed circuit.

A belt scale and feed particle size analyzer on the HPGR screen oversize transfer conveyor will provide material throughput data to the PCS along with closed circuit viewing capability.

An open steel framed transfer station will facilitate transfer between the two conveyors. It will have an elevated platform that surrounds the head end drive of the HPGR screen oversize transfer conveyor along with the HPGR screen oversize return belt magnet. This self-cleaning magnet will be suspended from the transfer station steel and will be positioned over the head end of the HPGR screen oversize transfer conveyor to catch and remove tramp metal that previously was routed around the upstream HPGRs by metal detectors and diverter gates.

Normally, the HPGR screen oversize return conveyor will return HPGR screened oversize back onto the HPGR feed bin conveyor to complete the closed circuit. However, a diverter gate at the head end of the HPGR screen oversize return conveyor can be activated to bypass the recycled feed to an outdoor bunker. In conjunction with activation of the diverter gates at the HPGR feed, this will allow operational flexibility for continual partial feed to the cyclone pump box should both HPGRs happen to be down.

17.3.6 Ball Mill Grinding Circuit

The ball mill grinding circuit processes are summarized as follows.

Milling of crushed ore down to the target size (P_{80}=214 µm) will be accomplished in two parallel ball mill trains, each operating in closed circuit with a cluster of hydrocyclones. Each circuit will be capable of treating 1,472 t/h of new feed. HPGR screen undersize (new feed) will be combined with ball mill discharge and process water in a 281 cubic meter cyclone feed pumpbox and pumped by a 2,000 kW cyclone feed pump to a cyclone cluster consisting of twelve (ten operating, two standby) 840 mm diameter cyclones. Cyclone underflow, at 78% solids by weight flows by gravity to the ball mill feed chute and into a 7.9 m Ø by 13.4 m dual pinion drive grinding mill. The drives are powered by two variable frequency drives, 9,000 kW, low synchronous motors. Cyclone overflow, at 35% solids by weight and a P_{80} of 214um, will flow by gravity through a metallurgical quality sampler to the feed box of a rougher flotation line. The sample itself will be sent to a multiplexer and staged for analysis. Sampling and on-stream analysis are discussed in more detail in Section 17.4.6.

Balls will be delivered to site by truck and transferred to a storage bunker. Balls will be metered out of the bunker and delivered to a high lift pocket conveyor system. The balls will discharge the high lift conveyor on to a ball mill transfer conveyor equipped with a belt scale. Belt plows will be engaged as required to direct the steel balls to either of the two balls mills. The system will operate on an as needed basis to maintain an optimum ball charge in each mill and ensure grinding efficiency. Two ball charging kibbles are also provided for operation in batch in case the ball transfer conveying system is down.

Both ball mills will be equipped with a ball mill magnet positioned on the ball mill discharge, capturing any ball chips exiting the mill and preventing this tramp metal damaging the downstream cyclone feed pumps. Collected chips will be discharged to a ball mill scats bunker.

Lime slurry will be added into the cyclone overflow and underflow launders to help control the pH of the flotation feed stream. Collector can be added into the ball mill feed chute and cyclone feed pumpbox.

Process water will be piped to the cyclone launders and to the ball mill trommel to satisfy process requirements for water and for clean-up.

Flow and density will be measured on the cyclone feed line. Flow of process water to the pumpbox will be controlled to maintain the feed density to the cyclone.

17.3.7 Rougher Flotation

The rougher flotation unit operations are summarized as follows.

Cyclone overflow from each ball mill circuit flows from the samplers into the flotation circuit. Each ball mill line will feed its own rougher flotation train. Slurry flows into the feedbox of a rougher flotation line, consisting of six 300 m^3 forced air, tank flotation cells each equipped with a 265 kW motor with variable frequency drive.

Collector, frother, and promoter will be added to the feed box of each line and provisions for additional reagent addition in the third and fifth cell are incorporated into the design. Air from the low-pressure blowers (Section 17.4.5) is delivered to the flotation cells.

The six cells provide a total retention time of approximately 28 minutes and during this time the majority of the copper sulfide minerals, as well as other sulfide minerals, will be separated from the gangue material in the slurry and float to the top of each cell. Concentrate from both lines will be collected in a common launder, sampled and pumped to the regrind circuit.

In the event that the concentrate produced by the first and second cells in a line contains high-grade of copper the ability to divert these streams directly to the second cleaner flotation stage has been incorporated into the design.

The tailing streams from line one and line 2 are sampled individually, allowing the performance of each line to be evaluated separately. The sample is pumped to a multiplexer and from there to an analyzer system. The discharge of the sampler, final tailing, flows by gravity the tailings pumpbox.

Froth cameras will monitor the speed and colour of the froth on each cell. Imaging software in conjunction with an expert system will provide information on how best to optimize cell performance.

17.3.8 Primary Regrind

The concentrate regrinding process is summarized as follows.

As described in Section 13.0, in order to perform an initial separation of the copper sulfide minerals from other gangue minerals a grind size of approximately 40 µm is required. Additional regrinding to 20 µm is required to fully liberate the copper bearing material. This is discussed below. A vertically stirred mill operating in closed circuit with a set of cyclone-cluster, at a recirculating load of 250%, has been selected as the appropriate technology to achieve the 40 µm grind.

New feed (i.e., rougher concentrate) is introduced into the system via the primary regrind cyclone feed pumpbox and is mixed with the product from the 4,500 hp mill. The resulting slurry is classified in a cyclone cluster comprised of twenty-five 375 mm diameter cyclones (22 operating, 3 standby). Cyclone overflow with a P_{80} of 40 µm will be sampled and will gravity flow to the head of the first cleaner flotation bank.

Cyclone underflow will exit the cyclone cluster's discharge launder and flow by gravity into the bottom fed mill. A fraction of the underflow will be diverted to the gravity concentration circuit and processed as discussed in the following section. As noted above, mill overflow discharges directly to the primary regrind cyclone feed pumpbox.

Lime can be added to cyclone underflow and overflow launders as needed to control pH in the flotation circuit.

Grinding balls for the regrind mill will be stored at a storage facility and transferred to the mill as required using Kibbles (ball buckets).

17.3.9 Gravity Concentration

The concentrate regrinding and gravity processes are shown on process flow diagram. Equipment details are reported in the mechanical equipment list.

As mentioned above a portion of the primary regrind cyclone underflow, equal to approximately 20 to 25% slurry is diverted to a single centrifugal gravity concentrator. Gold, high specific gravity gold-bearing sulphide materials will be removed by the centrifugal action of the equipment. Tailings are discharged from the concentrator to the primary regrind cyclone feed pumpbox. Concentrate is flushed, with clean fresh water, from the bowl on a periodic basis and collected in one of two storage tanks.

The gravity concentrate slurry will be transferred to the Cu Concentrate thickener.

17.3.10 First Cleaner Flotation

The first cleaner flotation process is summarized as follows.

Cleaning of the rougher copper concentrate is accomplished in a three stage cleaner flotation circuit with the concentrate advancing forward through the circuit and the tailings being returned though the circuit counter-current to the concentrate.

First cleaner flotation and cleaner scavenger flotation will occur in a single row of nine 100 m^3 forced air tank flotation cells equipped with a 132 kW fixed speed motors. The first three cells will provide nine minutes of residence time and will serve as the first cleaners; the next six cells provide 27 minutes of residence time and act as the cleaner scavenger cells.

Classified product from the primary regrind is combined with the second cleaner tailing stream in the feed box of the first cleaners. In addition to the primary process streams, reagents (collector, promoter, and frother) can all be added to the feedbox and to the third cell in the bank. Additionally lime can be added to the feed box to control the pH of the slurry in the first cleaners.

Concentrate off the first cleaner flotation cells is collected in a single launder will flow, by gravity, to the first cleaner concentrate pumpbox from where it's pumped to the secondary regrind cyclones. An inline sampler will sample the pressurized stream and forward the sample on for analysis.

Tailings from the first cleaners flow directly to the fourth cell in the bank, the start of the cleaner scavengers. Reagents (collector, frother, promoter) can be added to the second and fourth cell in the bank. There is no requirement for any pH modification in the cleaner scavenger circuit.

Concentrate from the cleaner scavenger cells is collected and pumped to the first cleaner concentrate pumpbox. A pressurized in line sampler will withdraw a sample for analysis. On-line sampling and analysis are discussed in Section 17.3.20.

A metallurgical quality sample is taken from the cleaner scavenger tailing stream before the slurry is pumped to the final tailing pumpbox.

Froth cameras will monitor the speed and colour of the froth on each cell. Imaging software in conjunction with an expert system will provide information on how best to optimize cell performance.

17.3.11 Secondary Regrind

The secondary regrind circuit is summarized as follows.

Horizontal stirred mill has been selected as the appropriate technology for the Ajax secondary regrind application in order to reduce the grind size of the first cleaner concentrate to a P_{80} of 20 µm.

First cleaner concentrate is pumped to a secondary regrind cyclone cluster consisting of 14 (12 operating, 2 standby) 75 mm diameter cyclones. The cyclones primary purpose is to dewater the incoming feed material and produce a mill feed density in the range of 50% solids.

Cyclone overflow will be sampled and flow by gravity to the head of the bank of second cleaner flotation cells.

Cyclone underflow, at 50% solids by weight, passes over a trash screen and discharges to the secondary regrind feed pumpbox and is pump to the horizontal stirred. The mill will be powered by a 1,120 kW motor.

The mill operates in an open circuit. Slurry travels through the mill in a ‘plug’ flow pattern through consecutive grinding discs. Media recirculates between the rotating discs distributing grinding action throughout the mill. Grinding is by attrition and abrasion of the particles in contact with the high speed, small, circulating media. This breakage mode produces very fine sized particles at relatively low power consumption.

Ground product at the 20 µm specification exits the mill and is pumped to the second cleaner flotation cells.

Media (ceramic beads) for the mill is delivered to site in one tonne bags and charged to the mill through via the regrind media hopper. An eductor fed with process water is used to withdraw media from the hopper and transfer the beads to the secondary regrind feed pumpbox. The pumped media will be dewatered with a screen before the beads are introduced to the pumpbox. Water is returned to a charger tank and reused to transport media.

17.3.12 Second & Third Cleaner Flotation

The secondary regrind circuit is summarized as follows.

Secondary regrind cyclone overflow, mill discharge and third cleaner tails are combined with reagents (collector, promoter, and frother) in the feed box of the second cleaner flotation bank. Lime will be added upstream of the flotation cells, in either the cleaner scavenger concentrate pumpbox or the regrind cyclone underflow launder, to control the pH in the second cleaner flotation cell. Three 50 m^3 forced air tank cells with 75 kW impellor motors provide 12 minutes of residence time. Tailing stream from the second cleaner cells is pumped to the first cleaner cells. Concentrate is collected, sampled, and pumped to the feed box of the third cleaner flotation cells. An option remains to pump second cleaner concentrate to the concentrate thickener deaeration tank if appropriate final grade is achieved.

The second cleaner concentrate is combined with reagents in the feed box of the final cleaning stage. Two 30 m^3 forced air tank cells with 37 kW impellor motors provide 12 minutes of residence time. Third cleaner tails are pumped to the second cleaner flotation cells and third cleaner concentrate flows by gravity to the third cleaner concentrate pumpbox and is subsequently pumped to the concentrate thickener deaerator tank. A metallurgical quality sample prior to the pumpbox collects a sample for metallurgical accounting and process control purposes.

Froth cameras will monitor the speed and colour of the froth on each cell in both cleaning stages. Imaging software in conjunction with an expert system will provide information on how best to optimize cell performance.

17.3.13 Concentrate Dewatering

The concentrate dewatering operations are summarized as follows.

Third cleaner concentrate and possibly the second cleaner concentrate and gravity concentrate, pumped to the concentrate thickener deaeration tank. The tank is designed to allow air to release from the aerated slurry and to mitigate the effects entrained air can have on the sedimentation characteristic of flocculated concentrate slurries. Filtrate from the downstream filtration step will be returned to the thickener through the deaeration tank and lime, gravity circuit concentrate, and flocculant can all be added into the tank as required. Flocculant can be added to the thickener's feed well itself.

Deaerated slurry will flow down the feed well of the 12.5 m diameter high-rate thickener to the thickener's feed well. Thickener overflow will be pumped to the cyclone feed pumpboxes. Thickened slurry, at 60% solids (by weight) will be pumped to the concentrate filter feed tank.

The final dewatering operation will be conducted by an automatic pressure filter. Filter cake at eight percent moisture will discharge the filter and drop onto the first of two concentrate stockpile feed conveyors. A diverter chute at the discharge end of the first conveyor will direct the concentrate directly to the floor and the first of two stockpiles, or alternatively, to a second concentrate feed conveyor that discharges to the second stockpile.

The two stockpiles, stockpile 1 to the south and stockpile 2 to the north, will each be of design height of 21 m and hold 4,000 t for a total design storage of 8,000 t. Two stockpiles will give flexibility for operations to separate concentrate for non-spec material or controlled blending as appropriate. The stockpiles will be contained on three sides by a 5 m high concrete retaining wall with the open east side facing the loadout area. Another 5 m high wall running east to west will physically separate the two stockpiles.

Dust hoods at the loading areas of the conveyors will collect dust and duct it to the concentrate area dust collector. Collected dust will be returned back into the system.

Front end loaders will be used to reclaim concentrate and load the 50 tonne concentrate haulage trucks. A wheel wash will be included inside to service trucks prior to exiting the building. Wash down from the trucks will be collected by a sump for return into the system.

All haul trucks will be weighed entering the site and weighed and sampled before leaving the site.

17.3.14 Tailings Thickening

The tailing pumpbox and tailing thickener unit operations are summarized as follows.

All of the tailings streams from the process, namely the rougher tailings and the cleaner scavenger tailings are collected in a single 279 m^3 pumpbox. Additionally, the Assay and Metallurgical Laboratory waste will be sent to this pumpbox. Further, the reagent sumps will all have the capability of being directed to this pumpbox. Process water can be added to the sump to maintain slurry density and ensure minimum flow requirements of the tailings thickener feed pump are maintained.

Flocculant is added to the pumped thickener feed and the material is dewatered in a 65 m high rate thickener. Overflow from the tailing thickener is distributed to process water users in the process plant. Underflow is pumped through one of two discharge line (one operating, one standby) by three 1,100 kW centrifugal pumps operating in series. Three pumps will be required to generate the required pressure to deliver the thickened slurry (60% solids by weight) to tailings storage facility.

In the event of a failure in the tailings pumping system, the thickener underflow can be diverted to an emergency pond.

17.3.15 Tailings Handling

The tailings handling unit operations are summarized as follows.

The thickened tailings stream will be the final plant tailings. As indicated above the final tailing stream is pumped to a TSF. Tailing disposal and storage are discussed in detail in Section 18.4.

Water released from the solids in the TSF is reclaimed by barge-mounted pumps and transferred to the reclaim water tank and reused in the process plant as process water.

17.3.16 Reagent Handling & Storage

The reagent delivery and mixing systems are summarized as follows.

All reagent handling and storage systems will comply with WHMIS compliance. Table 17-2 identifies the function, process application and annual consumption of reagents. Reagent costs are discussed in Section 21.2.

In addition to the reagent systems described in Table 17-2 an additional system has been included in the design to allow operation to test different reagents. This system is based on a solid reagent make up system and is identical to the collector system described below.

Table 17-2: Process Reagents

Reagent	Function	Process Application	Consumption (dmt/a)
Quicklime	pH modifier	Grinding, Flotation	6,704 (100% activity)
PAX	collector	Flotation	387
OrePrep F-547	frother	Flotation	413
MX900	promotor	Flotation	309
AF306HH	flocculant	Concentrate Thickening	6.7
AF306HH	flocculant	Tailing Thickening	516

17.3.16.1 Lime

Quicklime will be delivered to site in tanker trucks and will be pneumatically transferred from the truck to a 300 tonne storage silo using dedicated blowers. Lime will be drawn out of the silo by a combination of a rotary valve, equipped with a variable frequency drive, and a screw feeder that metres lime to a mix box upstream of the vertical stirred mill type slaker. Fresh water addition to the mix box is controlled by the lime addition rate. Slaked lime, at 20% by weight is pumped to a lime holding tank and distributed to the various users via a constantly circulating pressurized ring header.

Controlled addition of the lime to the users is managed by control valves responding to pH measurements throughout the circuit.

The lime silo is equipped with a dust collector to capture any dust generated during the unloading process. Additional environmental protection measures are taken to ensure any emissions generated during the slaking process are not allowed to reach the atmosphere. A water scrubber treats any gases leaving the circuit via the lime slaking separating chamber before they are vented to the atmosphere.

A safety shower and eyewash station is dedicated to the lime preparation area.

17.3.16.2 Collector

Collector will be delivered to site in one tonne bags. The reagent will be dissolved in a 15.5 m^3 tank and the resulting 10% w/v solution transferred to a 30 m^3 holding tank.

Centrifugal pumps will circulate the solution through a ring header back to the holding tank. Collector addition will be metered into the process at the following unit operations:

- Cyclone feed pumpbox
- Ball mill feed chutes
- Rougher flotation
- First cleaner flotation
- Cleaner scavenger flotation
- Second cleaner flotation
- Third cleaner flotation.

Reagent addition will be measured and controlled based on an operator set point that ratios the reagent addition rate to the fresh feed throughput calculation. Both the mix tank and holding tank will be vented by the collector area exhaust fan. The reagent will be contained within a dedicated bunded area equipped with a dedicated sump pump. Sump discharge can be directed to either the mix tank or to the final tailing pumpbox.

Two safety shower and eyewash stations services the collector and test reagent area.

17.3.16.3 Frother

Frother will be delivered to site in tanker trucks and off-loaded into a 45 m^3 holding tank. The chemical will be circulated around a pressurized ring header discharging back into the holding tank.

The header will maintain a constant pressure on the reagent distribution lines feeding the flotation process at the following process steps:

- Rougher flotation
- First cleaner flotation
- Cleaner scavenger flotation
- Second cleaner flotation
- Third cleaner flotation.

Reagent addition will be measured and controlled based on an operator set point that ratios the reagent addition rate to the fresh feed throughput calculation. Because of the hazardous nature of the frother it will be located outdoor in a dedicated area, isolated from the other reagents. The storage tank will be contained within a bunded area equipped with a dedicated sump pump. Sump discharge can be directed to either the holding tank or to the final tailing pumpbox.

A dedicated safety shower and eyewash station will be provided within the frother's bunded area.

17.3.16.4 Promotor

Promoter will be delivered to site in tanker trucks and off-loaded into a 45 m^3 holding tank. The chemical will be circulated around a pressurized ring header discharging back into the holding tank. The header will maintain a constant pressure on the reagent distribution lines feeding the flotation process at the following process steps:

- Rougher flotation
- First cleaner flotation
- Cleaner scavenger flotation
- Second cleaner flotation
- Third cleaner flotation.

Reagent addition will be measured and controlled based on an operator set point that ratios the reagent addition rate to the fresh feed throughput calculation. The reagent will be contained within a dedicated bunded area equipped with a dedicated sump pump. Sump discharge can be directed to either the holding tank or to the final tailing pumpbox.

A dedicated safety shower and eyewash station will be provided within the frother's bunded area.

17.3.16.5 Flocculant

Two separate flocculant systems will be required. The first will make up the flocculant for the concentrate thickening application, the second, for the tailing thickener application. Although designed for different capacities the preparation process is the same in either case.

Flocculant will be delivered to site in solid form in 25 kg paper sacks. A solution (0.25 weight by volume) will be prepared using fresh water by an automated flocculant metering and mixing system, and transferred to a holding tank. Positive displacement pumps will meter flocculant to the thickeners. Secondary dilution of flocculant (to 0.025 weight by volume) will occur through the addition of process water to an in-line mixer located at the thickeners.

17.3.17 Assay & Metallurgical Laboratory

The assay and metallurgical laboratory will be located in a stand-alone facility situated adjacent to the mill building. All the necessary instruments and facilities required to support the analytical demands of the mine, the concentrator, and environmental departments will be housed in this structure.

The design provides for the analysis of up to 400 samples per day, for primary elements gold, silver and copper. Analysis will consist of fire assaying, wet chemistry titrimetric-gravimetric methods, and instrument methods, using Atomic Absorption, ICP and Leco. The major components of this laboratory will be the metallurgical lab, sample preparation lab, fire lab, wet chemistry lab, low-level lab and the instrument room. Support areas will include rooms for mechanical, electrical, gas bottle storage, washrooms and offices.

In addition to assaying facilities, the building will house the metallurgical laboratory. This lab will undertake all necessary testwork to monitor metallurgical performance, calibrate on-line analytical devices, and to improve the process flowsheet unit operations, and overall plant metallurgy (grades and recoveries). The laboratory will be equipped with bench-scale crushers, ball mills, particle size sieves, flotation devices, balances, pH metres, etc.

The facility design will meet international safety and hygiene standards, produce high quality work efficiently, have minimal impact on the local environment and it must meet KAM's health, safety and environmental guidelines. Accordingly, provisions for the accumulation and disposal of solid, hazardous, and universal laboratory waste products will be made in the design.

Ventilation systems will be designed, engineered and installed so that personnel protective equipment is used as backup and not the primary method of protection. Good ventilation must capture fugitive dust or other fumes that could be hazardous if inhaled.

17.3.18 Water Supply

17.3.18.1 Fresh Water

The water supply systems are summarized as follows.

The fresh water supply system is designed at 1500 m^3/h to the plant based on the water balance. Fresh water will be pumped from Kamloops Lake to the mine site. A series of booster stations are required to overcome the hydraulic head associated with the elevation and distance to the mine. At the site, fresh water is distributed to three fresh/fire water tanks servicing and protecting the following areas:

- Truckshop/warehouse and truck wash
- Primary crusher area
- Process plant.

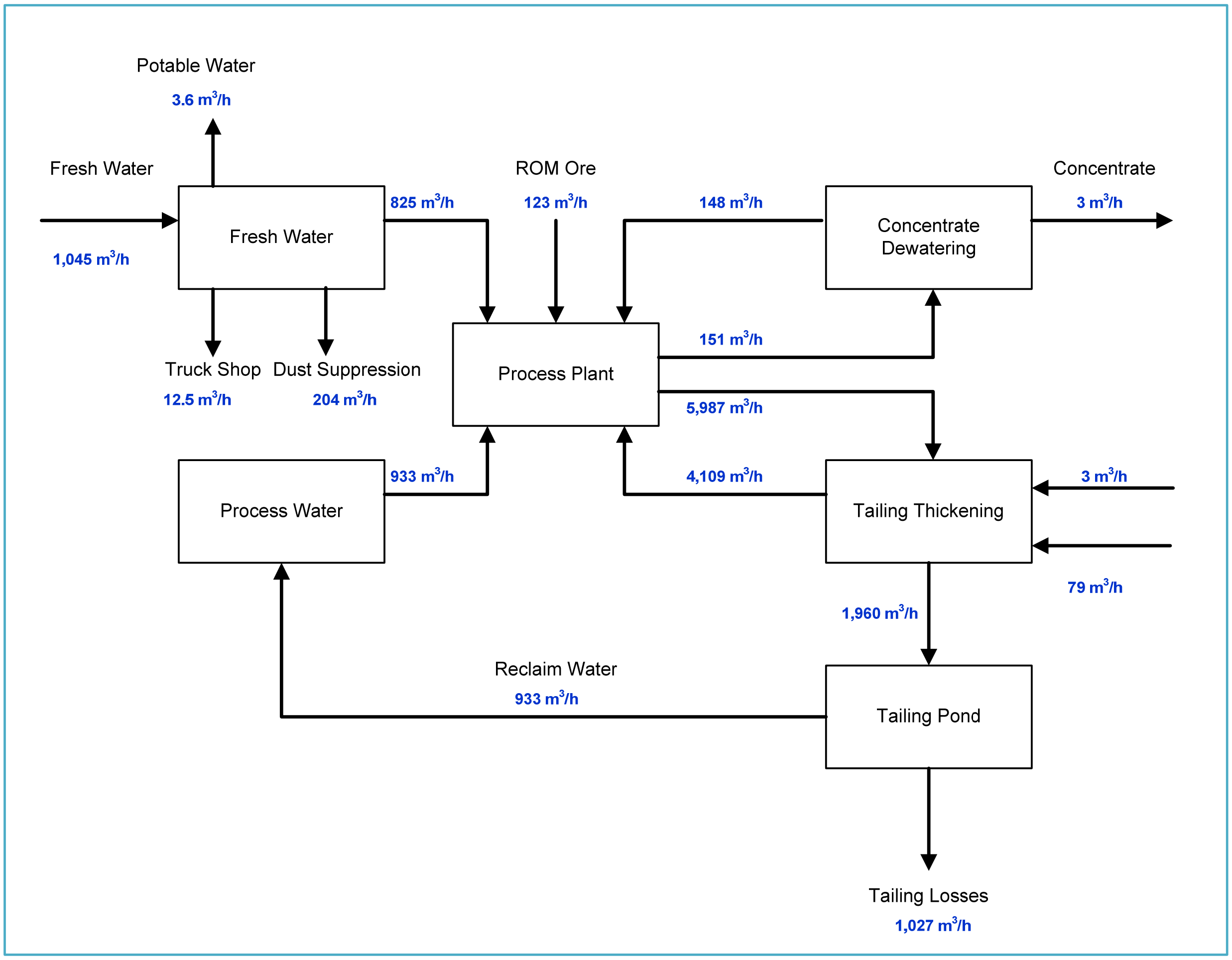


Figure 17-2: Simplified Site Wide Water Balance

Each tank will be designed to store sufficient fire water for use in the event of an emergency. This fire water will be reserved for fire water usage. Two fire water pumps (one electric and one diesel backup) can access the fire water reserve in the event of a fire. A jockey pump maintains pressure in the fire water system when not required.

Fresh water is used for:

- Potable water production
- Dust control on roads
- Mining unit operations
- Cooling water
- Gland water
- Reagent preparation
- Gravity circuit fluidization
- Process water make-up.

Potable water will be supplied to the administrative buildings around the site and will provide make-up water to the safety shower loop on demand. Water in the safety shower loop will be maintained at the recommended temperature by a tepid water-mixing skid.

17.3.18.2 Process Water

Process water will be recovered at three locations in the process:

- Concentrate thickener overflow, which will be pumped in the cyclone feed pumpboxes and used as dilution water.
- Tailing thickener overflow, which will be pumped to the HPGR screens, the ball mills and the cyclone feed pumpbox.
- Reclaim water from the tailings pond, which will be pumped to a reclaim water storage tank and distributed throughout the plant for launder water, cyclone feed pumpbox, secondary flocculant dilution, and dilution water.

17.3.19 Air Supply

Dedicated compressed air systems will supply high-pressure air to the following areas.

- Primary crusher – A single compressor will supply dried air to dust collectors.
- Secondary and tertiary crushers – two compressors (one operating, one standby) supply dried air to dust collectors in the secondary and tertiary crushing areas.
- Process plant – Compressed air is supplied by three, dedicated process plant air compressors each producing sufficient compressed air for the concentrator facilities and the fine ore stockpile.
- Process Plant – Instrument air will be supplied to the process plant and the fine ore stockpile from two (one operating, one standby) compressors dedicated to the production of instrument air. Instrument air is dried and held in a dedicated air receiver.
- Filter presses – Compressed air necessary to the operation of the concentrate filter presses will be supplied by two (one operating, one standby) air compressors reserved solely to provide air to the filters.
- Truckshop – The truckshop will be serviced by two (one operating, one standby) air compressors.

Low-pressure air for the flotation cells will be provided by three (two operating, one standby) 36,000 m^3/h, 560 kW blowers.

17.3.20 Online Sample Analysis

The process plant will be equipped with automatic samplers to collect representative shift samples for use in metallurgical accounting, process control and to produce a representative sample to feed to the on-line analytical devices that will generate real-time information to facilitate process control decisions by the plant operators. The location of the samplers and type of sampler are shown in Table 17-3.

Table 17-3: Sampler Location & Function

Equipment Number	Sample Location	Sample Type
4710-SAM-1001	Rougher Feed 1 Sampler	Metallurgical
4710-SAM-1003	Rougher Tailing 1 Sampler	Metallurgical
4710-SAM-2002	Rougher Feed 2 Sampler	Metallurgical
4710-SAM-2004	Rougher Tailing 2 Sampler	Metallurgical
4710-SAM-1005	Rougher Concentrate Sampler	Process Control, Pipe
4710-SAM-1006	Rougher Scavenger Concentrate Sampler	Process Control, Pipe
4710-SAM-1007	Primary Regrind Cyclone Overflow Sampler	Process Control, Pipe
4710-SAM-1008	1st Cleaner Concentrate Sampler	Process Control, Pipe
4710-SAM-1009	Cleaner Scavenger Concentrate Sampler	Process Control, Pipe
4710-SAM-1010	Cleaner Scavenger Tailing Sampler	Metallurgical
4710-SAM-1011	Secondary Regrind Cyclone Overflow Sampler	Process Control, Pipe
4710-SAM-1012	Secondary Regrind Discharge Sampler	Process Control, Pipe
4710-SAM-1013	2nd Cleaner Concentrate Sampler	Process Control, Pipe
4710-SAM-1014	2nd Cleaner Tailing Sampler	Process Control, Pipe
4710-SAM-1015	3rd Cleaner Concentrate Sampler	Metallurgical
4710-SAM-1016	Concentrate Load Out Sampler	Truck Sample

The on-stream analyzers (OSA) utilizing X-ray fluorescence spectrometry (XRF) will be used to monitor the performance of the flotation process in various streams in order to optimize concentrate grade and metal recoveries.

The particle size analyzers (PSA) will be used to maintain the optimum grind sizes for the grinding and regrinding circuits. Particle-size analyzers will provide the main inputs to the control system.

Two on-stream analyzers will be installed, one to measure high-grade material and one for low-grade material. Additional PSAs are required to control the grinding operations. Each analyzer will receive samples from several locations. Sample management will be accomplished with the use of a multiplexer prior to each analyzer. The multiplexers will divert specific streams to the analyzers or to the PSA in accordance with a programmed sequence.

Sample rejects are pumped back to an appropriate location with the main process.

17.3.21 Key Process Equipment Overview

Detailed equipment specifications have been prepared for all major equipment. This includes process equipment, underground piping, process piping, buildings, electrical equipment, control valves, on/off valves, process control system, etc.

17.3.21.1 Gyratory Crusher

The gyratory crusher will be installed in the primary crusher station. It will be a 60-110 size class crusher with a 1,200 kW fixed speed motor. It will come with a lubrication and hydraulic system on a common skid, lubrication cooling units, a spider lubrication system, a dust seal blower, and an eccentric cart for maintenance.

The gyratory crusher will be of the conventional bottom service design. That is, the eccentric cart will provide access under the crusher to maintenance the hydraulic jack and eccentric assembly. This process will be reversed for installation. A spare mainshaft/mantle assembly and a mainshaft storage stand will be provided so that mantle liner replacements can be carried out independent of operation of the crusher in the dedicated maintenance area behind the dump pocket.

17.3.21.2 Cone Crushers

Two cone crushers will be located side by side in the secondary and tertiary crushing building. Each cone crusher will be of the 1250 hp (930 kW) size class. It will come with a lubrication and hydraulic system on a common skid, lubrication cooling units, a dust seal blower, and a feed bowl for choke feed of the crusher. The motor and V-belt drive assemblies for the two will be mirror imaged in order to position them side by side at a close 6 m centres.

A spare mantle assembly will be provided so that mantle liner replacements can be carried out independent of operation of the crusher.

17.3.21.3 High Pressure Grinding Rolls (HPGR)

Two HPGRs will be located side by side in the secondary and tertiary crushing building. Each HPGR will be of the 2 x 3552 hp (2 x 2650 kW) size class. Each will come with a hydraulic and lubrication system including lubrication coolers. Each HPGR will come with retractable feed hoppers for grinder access.

Spare HPGR grinding rolls including the maintenance equipment and spares required to disassemble and reassemble on site will be provided. Refurbishment of the grinding surfaces will be done off site.

17.3.21.4 Plant Conveyors

The conveyors of the Ajax Project will be provided by a single supplier responsible for the design, manufacture, and supply. This will include mechanical components such as belting, idlers, and diverter gates, ancillaries such as magnets, metal detectors, and weigh scales, instruments such as pull cord switches, and also support structural steel including elevated walkways, trusses, and support bents.

Conveyors will have a dust hood covering the top of the belt and running the length of the conveyor to protect the material from the elements and minimize dust egress. Elevated portions of the conveyor will have walkways on both sides.

Generally, the belt conveyors will be designed to 80% of maximum recommended CEMA cross-sectional loading at design capacity based on a speed from 2.5 to 3.5 m/s. In some cases, the speed or loading may vary from this in order to suit the application.

A summary of the conveyors in the Ajax Project is shown in Table 17-4.

Table 17-4: Summary of Conveyors

Conveyor Name	Belt Width (mm)	Approximate Length (m)	Number of Motors	Total Installed Power (kW)	Type of Drive	Takeup Type
Coarse Ore Stockpile Feed Conveyor	1,524	1455	3	3,300	VFD	Gravity
Cone Crusher Screen Feed Conveyor 1	1,524	175	1	150	Fixed Speed With Fluid Coupling	Gravity
Cone Crusher Screen Feed Conveyor 2	2,134	270	3	1,008	Fixed Speed With Fluid Coupling	Gravity
Cone Crusher Screen Oversize Transfer Conveyor	1,524	25	1	30	Fixed Speed With Fluid Coupling	Fixed
Cone Crusher Feed Conveyor	1,524	255	2	530	Fixed Speed With Fluid Coupling	Gravity
Fine Ore Stockpile Feed Conveyor	1,524	265	1	450	Fixed Speed With Fluid Coupling	Gravity
HPGR Feed Bin Conveyor	2,134	350	3	1,350	Fixed Speed With Fluid Coupling	Gravity
HPGR 1 Feed Conveyor	2,134	15	1	19	VFD	Fixed
HPGR 2 Feed Conveyor	2,134	20	1	19	VFD	Fixed
HPGR Screen Feed Conveyor	2,134	270	2	900	Fixed Speed With Fluid Coupling	Gravity
HPGR Screen Oversize Transfer Conveyor	1,524	150	1	190	Fixed Speed With Fluid Coupling	Gravity
HPGR Screen Oversize Return Conveyor	1,524	110	1	93	Fixed Speed With Fluid Coupling	Gravity
Concentrate Stockpile 1 Feed Conveyor	1,067	25	1	19	VFD	Fixed
Concentrate Stockpile 2 Feed Conveyor	914	30	1	11	Fixed Speed With Fluid Coupling	Fixed

17.3.21.5 Rock Breaker

The rock breaker will be used to break up oversized rock in the dump pocket of the primary crusher station. It will be mounted on a concrete pedestal and come with a boom, hydraulic hammer, hydraulic power unit, and joystick controllers. The hydraulic power unit will have immersion heaters in the oil reservoir to allow outdoor placement. It will be powered by a 112 kW motor that will be controlled and powered from its own integral motor starters.

Normally, the rock breaker will be controlled by the control joystick in the primary crusher control room. However, a portable radio control unit will be available to allow mobility for the operator.

17.3.21.6 Apron Feeders

The apron feeders will have variable speed motors to limit start-up current rushes and regulate feed rate as required. The apron feeders will come with instrumentation such as pull cord switches and speed sensors. The apron feeders on the Ajax Project are as follows:

- One primary crusher discharge apron feeder: 1,829 mm pan width and 150 kW motor
- Four coarse ore reclaim apron feeders: 1,372 mm pan width and 75 kW motor

- Three fine ore reclaim apron feeders: 1,372 mm pan width and 75 kW motor.

17.3.21.7 Belt Feeders

The belt feeders will be shallow troughed design with a belt supported by 20° picking type idlers. A hydraulic assisted tail take up will provide tension in the belt. Motors will be variable speed to limit start-up current rushes and regulate feed rate as required. Instrumentation such as pull cord switches and speed sensors will monitor the belt feeder.

The belt feeders on the Ajax Project are as follows:

- Two cone crusher screen belt feeders: 1,829 mm belt width and 112 kW motor
- Two cone crusher belt feeders: 1,524 mm belt width and 112 kW motor
- Two HPGR belt feeders: 1,829 mm belt width and 112 kW motor
- Two HPGR screen belt feeders: 1,829 mm belt width and 112 kW motor.

In order to quickly retract the entire belt feeder and allow access to the cone crusher underneath, the cone crusher belt feeders will be of steel truss design mounted on train wheels. A hydraulic power unit and hydraulic actuator assembly connected to the underside of the feeder will power retraction of the feeder during times of maintenance.

17.3.21.8 Vibrating Screens

The vibrating screens will be of the multi-slope (banana) double deck type design. Exciters of the counter rotating linear motion type will be mounted on the screen and connected by a universal shaft and V-belt drive to a fixed speed motor mounted beside the screen on a static base. Quick-change polyurethane square panels will form the screening deck. The screens will come with a coil spring isolation frame that will reduce dynamic loads to the support structure.

The screens on the Ajax Project are as follows:

- Two cone crusher screens: 3.7 m wide by 7.3 m long with a 30 kW motor. Comes with dust enclosure
- Two HPGR screens: 3.7 m wide by 8.5 m long with a 50 kW motor. Comes with water spray headers and nozzles.

17.3.21.9 Grinding Mills

Two ball mills will be located side by side in the grinding building. Each mill will be of 7.9 m diameter x 13.4 m (flange to flange) (26 ft x 44 ft) driven by two 9 MW low speed synchronous motors in closed circuit with cyclone cluster and cyclone feed pumps.

Each mill will come with a hydraulic and lubrication system, mechanical inching system, reducers with couplings, and trunnion magnets.

Installed ball mill power of 18 MW incorporates the allowance for drive train losses to determine the motor power from the pinion power, as well as a design contingency to account for the accuracy of the models, calculations, and testwork used to determine the expected average pinion power.

17.3.21.10 Flotation Cells

Tank style flotation cells with forced air will be used thought the flotation circuit. The Cu flotation circuit will include the following equipment:

- Rougher flotation cells consist of two lines of 6 x 300 m^3 each (8.6 m diameter x 6.6 m high) with 260 kW motor per cell
- First cleaner flotation cells consists of 3 x 100 m^3 each (4.6 m diameter x 4.9 m high) with 132 kW motor per cell
- Second cleaner flotation cells consist of 3 x 50 m^3 each (4.1 m diameter x 4.4 m height) with 75 kW motor per cell.
- Cleaner scavenger flotation cells consist of 6 x 100 m^3 each (4.6 m diameter x 4.9 m high) with 132 kW motor per cell.
- Third cleaner flotation cells consist of 2 x 30 m^3 each (3.5 m diameter x 3.7 m high) with 45 kW motor per cell.

17.3.21.11 Primary Regrind Mills

The primary regrind mill operates in closed circuit with cyclone cluster. A single vertical tower mill of 6.9 m diameter x 18.9 m high with a 3,357 kW (4,500 hp) motor has been selected for this application. The mill comes with speed reducer and couplings, cast screw liners, lube system and screw transporter.

17.3.21.12 Secondary Regrind Mills

The secondary regrind mill operates in an open circuit. A single horizontal high intensity regrind mill with a 1,120 kW motor has been selected for this application. Overall dimensions are 21.9 m L x 12.0 m W x 5.0 m H.

The horizontal mill comes with a multiple-disk stirrer and fine ceramic fluidized grinding media.

17.3.21.13 Concentrate Thickeners & Filtration

The concentrate thickening and filtration circuit consists of:

- A single 12 m diameter high rate thickener where the final flotation concentrate will be thickened to approximately 60% w/w solids.
- A single pressure filter to produce a filter cake of approximately 8.0 to 8.5% w/w moisture. The filter is a tower/vertical style pressure filter (4.2 m L x 3.9 m W x 6.4 m H) consisting of filter structure, wetted areas, filter plates, discharge system, belt wash system, and hydraulic system. The concentrate filter cake from the filter is discharge to a stockpile and stacked in the concentrate storage and load out area of 8,000 wet tonnes total capacity.

17.3.21.14 Tailings Thickeners

The tailings thickener consists of a 65 m diameter high rate elevated thickener to thicken flotation tailings to approximately 60% w/w solids and recover process water prior to discharge to the tailings management facility.

17.4 Process Control System

The process control system (PCS) will provide real time process control, motor control, data acquisition, data display, data logging, alarming, trending, reporting, and supervisory control The PCS will generate production reports for data and malfunction analysis as well as a log of all process upsets. All process alarms and events will be also logged by the PCS. The PCS will also provide an interface to a number of third party control systems as well as several stand-alone expert control systems.

The operator interface to the PCS will be via programmable computer (PC) based operator workstations located in the following control rooms:

- Primary crusher control room
- Secondary and tertiary crushing control room
- Central control room located within the process plant building.

The primary crusher control room and the central control rooms will be staffed by trained personnel on a 24-hour, 7-day ongoing shift basis. The secondary and tertiary crushing control room will not normally be staffed, but is available to the operators as needed.

Programmable logic controls (PLCs) or others third party control systems, supplied as part of mechanical packages, will be interfaced to the PCS via Ethernet network interfaces.

Control strategies within the PCS will be applied to control product particle size and to optimize fresh ore feed tonnage through the crushing, grinding and flotation circuits. Mill solid concentration variable-ratio control, dilution water flow rate control and level control will be carried out to reach the control targets. The process control philosophy for the operations is summarized as follows.

Expert systems (including rock size and froth analysis) will provide remote set point control to the PCS to further optimize the process control.

Operator field tablets will be capable of monitoring the entire plant site process operations and will be capable of viewing alarms and controlling equipment within the plant. Web access for remote viewing of the process will be provided to operations and maintenance personnel.

Field instruments will be microprocessor-based smart-type devices. Instruments will be wired to field mounted remote I/O cabinets. Ethernet cables will connect the remote I/O cabinets to the controllers in the respective Electrical rooms.

Intelligent-type motor control centres (MCCs) will be located in electrical rooms throughout the plant. A network interface to the PCS will facilitate the MCC’s remote operation and monitoring.

Closed circuit television (CCTV) cameras will be installed at various locations throughout the plant to provide process monitoring. These process monitoring cameras will be monitored from the central control room located in the process plant building.

Security cameras will be installed at various locations throughout the plant, including the administration building and the gravity circuit. These security cameras will be monitored from the gatehouse.

17.4.1 Dynamic Simulation

In order to identify potential bottlenecks or opportunities for design improvements and associated cost reductions in the proposed process flow sheet, Andritz Automation was engaged by KAM to develop a dynamic model of the processing plant treatment facility. Specifically, Andritz Automation focused on verifying that the surge capacities of stockpiles, bins, and pumpboxes. At the outset of the study, a prioritized list of scenarios addressing the needs of the Ajax Project was identified.

A dynamic model, built on the IDEAS™ software platform, representing the copper-gold recovery process for the Ajax Project was developed. The model incorporates engineering and process data, provided by the Ajax Project design team, to effectively simulate the proposed metallurgical processing plant. A customized simulation object library for mineral processing was selected to model the Ajax process. The dynamic model was used to study the various "what-if" scenarios relating to the process plant operations. The results from the initial study of various scenarios are summarized here.

17.4.2 Cone Crushers

If only one MP1250 cone crusher and one screen are operational while continuing to feed the HPGRs at the nominal rate it takes 15.5 hours to treat the material 'held' in the live section of the fine ore stockpile. Current projections indicate there will be approximately three days of capacity in the reserve component of the stockpile.

If one MP1250 cone crusher and two screens are operational while continuing to feed the HPGRs at the nominal it takes 19.2 hours to process the material held in the live section of the fine ore stockpile. Initial simulations indicate the total capacity of the stockpile (live plus reserve) will provide over 4 days capacity.

Based on a reported periodic maintenance (PM) downtime requirement it appears there is sufficient fine ore inventory to operate the HPGR circuit at the nominal rate for the duration regularly scheduled maintenance on a single cone crusher.

As the fine ore stockpile level at 100% provides more than enough inventory to conduct periodic maintenance (PM) on the cone crushers, there may be an opportunity to reduce the overall size of the fine ore stockpile to optimize the total volume, and reduce the capital cost.

The initial results suggest that the addition of a larger screen to the crushing circuit might not be necessary to maintain the online time of the plant.

17.4.3 HPGRs

If both HPGRs are bypassed, the maximum achievable feed rate to the ball mills is 1095 t/h while using all three fine ore apron feeders at 100% speed. This result indicates that if both HPGRs are out of service, there is not sufficient fine ore feed capacity available to operate both the ball mills simultaneously. At best, one ball mill can be run at approximately 70% of its nominal throughput capacity.

HPGR screen belt feeders 1 and 2 receiving the feed from HPGR screen feed bin are the variable speed feeders. In the current revision of P&IDs, they are manually controlled. This presents an opportunity to implement an automatic control for the speed of the HPGR screen belt feeders to better control the level of the HPGR screen feed bin.

17.4.4 Ball Mill Cyclone Feed Pump Boxes

If one or both cyclone feed pumps are tripped in the ball mill circuits while operating both HPGR circuits at the nominal capacity, this stops the feed to the ball mill circuits by stopping the HPGR screen belt feeders. Under the all scenarios of cyclone feed pump trips, the levels in the pump boxes were still maintained within an acceptable range (50% to 60%).

17.4.5 Regrind Cyclone Feed Pump Box

If one of the two rougher lines is taken off-line or brought back on-line by stopping or starting the feed from the grinding circuit, the level in the primary regrind cyclone feed pump box stays within control. The speed of the primary regrind cyclone feed pumps changes effectively to maintain the level in the pump box close to 50%.

17.4.6 Tailing Feed Pump Box

If one of the two rougher lines trips or brought back in operation by stopping or starting the feed from the grinding circuit, the level in the tailings pump box stays within the control. The speed of the tailings thickener feed pumps changes effectively to maintain the level of the pump box close to 50% with rougher and cleaner scavenger tailings reporting to it.

18 Project Infrastructure

The property associated with the Ajax Project is located in an area of historic mining activities. The project location currently has the two partially developed open pits, a historic haul road, historic reclaimed mine rock storage facilities and miscellaneous minor site access roads. The facilities and infrastructure for the project will include:

- Access and site roads
- Fresh water supply and sewage disposal
- TSF and water management
- Power supply and distribution
- Structural
- Communications
- Auxiliary infrastructures.

18.1 Access & Site Roads

The Ajax mine will be accessed via a new mine access road (Figure 18-1), planned to be constructed over the historic haul road (approximately 3.4 km long). The mine access road will connect the mine site to an upgraded Inks Lake interchange on the Coquihalla Highway. The mine access road will continue over Lac Le Jeune Road, with a new overpass planned to be constructed at this intersection. A short connector road will allow access to Lac Le Jeune road to the mine access road.

Upgrades will be required along a section of the existing Lac Le Jeune Road, relating to the intersection of the mine access road and Lac Le Jeune Road. This includes, but is not limited to a new left turning lane at the connector road and new road surfacing from the overpass to the turn lane area.

Inks Lake Interchange at the Coquihalla Highway will be upgraded with four new asphalt paved ramps (for both southbound and northbound highway directions), 4.2 km in total length.

The main access road to the plant site will have two lanes and will route the traffic east from the Inks Lake interchange to the site entrance/gatehouse. Access to Jacko Lake and Inks Lake Road will be maintained off the new mine access road.

New access road will be built from the site entrance/gatehouse to the plant site. The road will be 8 m wide with 1 m shoulder on both sides to allow two-way traffic and be suitable for all traffic including oversized loads. The sub-base and surfacing of the road will be 300 and 150 mm thick, built with material minus 75 mm and minus 19 mm, respectively.

From the main access road, separate roads will be provided to the explosive storage, explosive manufacturing plant, truckshop, primary crusher and heavy vehicle fuel station and other ancillary areas.

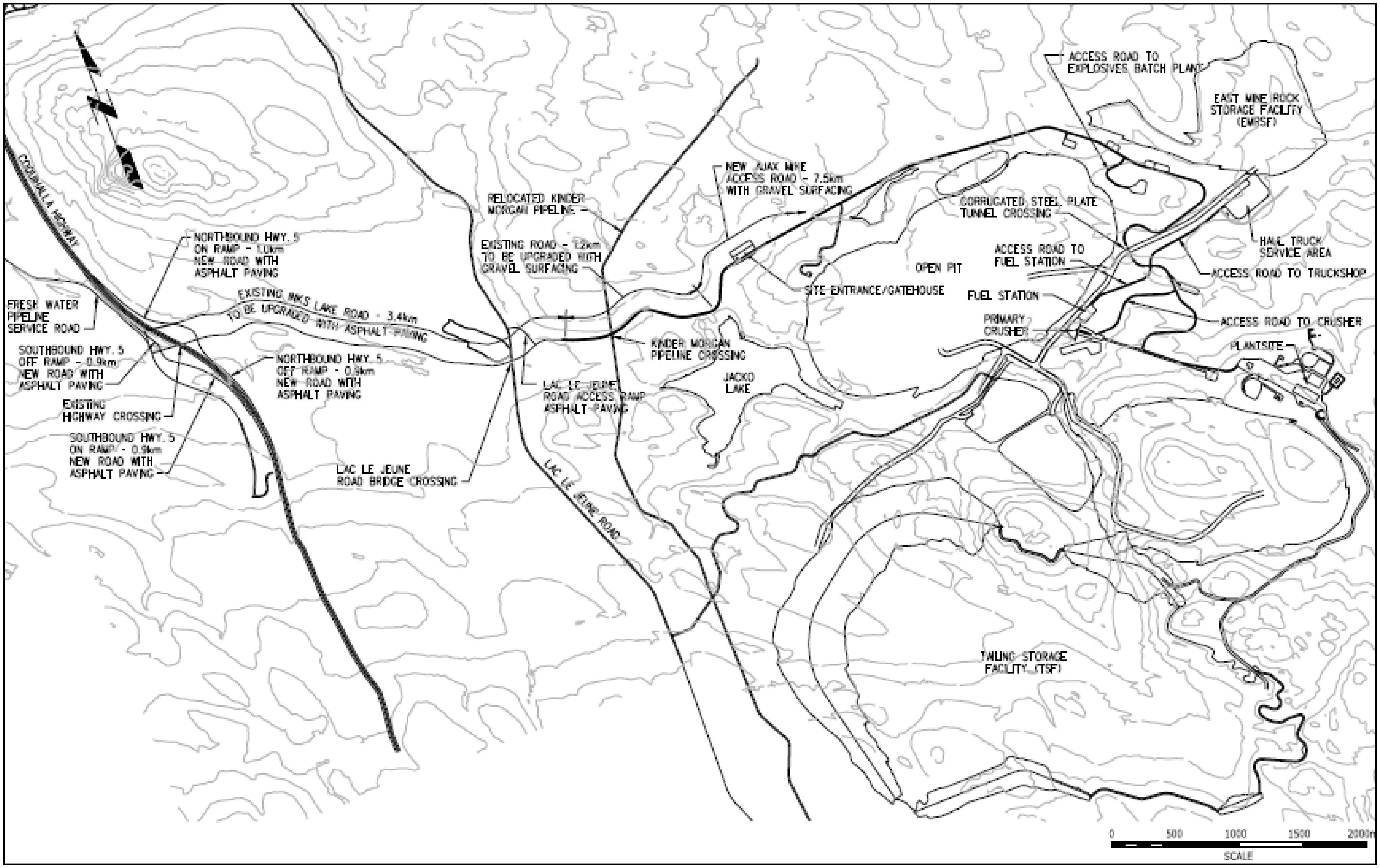


Figure 18-1: Mine Access Road to Ajax Mine

18.2 Geotechnical Conditions

The proposed mine development will involve the open pit, five external mine rock storage facilities (3 rock storage facilities, 2 low grade stockpiles), tailing management facility, process plant, primary crusher, truckshop explosives storage, and access road. Geotechnical conditions at these locations are summarized below.

BGC, Knight Piésold and Norwest have completed geotechnical investigations for various components of mine site infrastructure for the proposed Ajax mine. Additional 2015 site investigations were completed in the summer of 2015 to build upon the geotechnical information collected from the previous field programs.

18.2.1 General Geology

The Ajax property and associated ore mineralization occurs at the southern contact of the northwest trending sub-volcanic Iron Mask Batholith complex. This complex is Triassic to Early Jurassic in age and is composed of a number of intrusive units, which include the Iron Mask Hybrid, Pothook Diorite, Sugarloaf Diorite, and Cherry Creek Monzonite. The Triassic Nicola Group Volcanics, which includes tuffs, flows and breccias, occur south of the Iron Mask Batholith. The Nicola Group Volcanics are typically at greenschist facies metamorphic grade. Diamond drilling during the 2014 confirmed the presence of faults in the area. The northwest – southeast trending Cherry Creek Tectonic Zone and Edith Lake Fault Zone transect the property.

British Columbia has undergone repeated glaciation during the Quaternary era. The Cordilleran ice sheet covered the western Canadian mountains from Alaska in the north to Washington, Idaho, and Montana at its southern most extents. The episodic growth and decay of the Cordilleran ice sheet has imposed a general order to the sedimentation, where thick valley and lowland fills contain discrete packages of glacial sediments that are separated by unconformities or thin interglacial sediment packages (Clague, 2000). A generally consistent stratigraphic order exists within the glacial sediments. Typically, a distinctive sequence of glaciofluvial and lacustrine sediments were deposited during an early phase of glaciation and was subsequently overridden and eroded by subsequent glacial advances. The development of lodgment tills were typically generated during this stage. As the glaciers retreated, interglacial fluvial and lacustrine sediments, and ablation tills were deposited (Clague, 2000).

Following completion of the 2015 site investigation work, the overburden on the Ajax site was classified for engineering design purposes in four categories:

- Till – generally composed of SAND and GRAVEL, silty/clayey, well graded, non-plastic to low plasticity, brown to brownish grey, compact to very dense.
- Sands and Gravels - composed of SAND and/or GRAVEL, some clay or silt, poorly to well graded, non-plastic, light brown to grey, very loose to very dense, stratified to massive.
- Low plasticity clay - composed of CLAY and/or SILT, some sand, trace gravel, trace to some clay size particles, poorly graded, low plastic, brown to grey, stiff to very stiff, massive.

- Intermediate to high plasticity clay - composed of CLAY and/or SILT, some sand, trace gravel, intermediate to high plasticity, brown to grey, very soft to stiff, commonly massive but may contain rare examples of distorted laminations.

These material types are typical of glacially derived soil materials. Laboratory testing and characterization has been completed and geotechnical strength parameters assigned to the soil units for use in engineering designs. Refer to Sections 7.1 and 7.2 of this report for more details regarding geology.

18.2.2 Plant Site & Mine Site Infrastructure Foundation Conditions

Knight Piésold's geotechnical data reports contains geotechnical engineering recommendations for foundations associated with the plant site and truckshop area, explosives storage area, ore crusher, and access road.

Heavy static or vibratory loads should be founded on bedrock, which is found at relatively shallow depths on average of 2.8 m and up to approximately 7 m below existing ground surface in the area of the proposed plant site. Bedrock is also present close to existing ground surface at the location of the proposed ore crusher. Lightly to moderately loaded foundations may be placed on till or structural fill.

The Geotechnical Report, "Process Plant Site" by Knight Piésold provides information about ground conditions based on bore hole locations which do not match the latest arrangement of heavy facilities at the plant site such as grinding building, secondary and tertiary crushing, coarse and fine ore stockpiles and tailings thickener.

In order to proceed with detail design, additional geotechnical site investigations and detailed studies are required at the primary crusher, truckshop, plant site and explosives facility sites prior to completing foundation designs.

18.2.3 TSF Foundation Conditions

Norwest Corporation (Norwest) reviewed the previous geotechnical work performed by Knight Piésold Ltd., and commenced detailed study of the foundation geology on which the TSF embankments will be constructed, and the TSF basin where tailings and supernatant water will be contained. The project area contains a variably thick till blanket, up to more than 40 m thick, over slightly to moderately weathered igneous bedrock. The till varies widely in grain size, density and thickness, but is typically sandy silt glacial deposits, which are relatively compact to very dense overlying competent bedrock.

The 2015 TSF geotechnical site investigation program targeted areas of the footprint for infill drilling to confirm foundation strength parameters and conditions, as well identifying potential borrow areas within the footprint. Some areas of weak surficial soil units were identified that could affect embankment stability: one unit near the north embankment downstream slope in the western valley and the other unit beneath the south embankment. The near surface, low-medium plastic clays identified to date within the TSF footprint are located at shallow depth (<5 m) and it is planned to remove these materials as part of foundation preparation.

Lacustrine sediments were identified at depth in portions of the footprint and laboratory testing of these materials has been completed and geotechnical strength parameters developed for these materials. The updated foundation parameters have been integrated into the TSF design.

18.3 Tailings Disposal & Storage

18.3.1 General

Norwest carried out the design for the TSF for the Ajax Project included in this report.

The principal design objectives for the TSF are to provide containment for tailings and supernatant water during operations and dry land tailings containment in the long term (post-closure), and to achieve effective reclamation at mine closure. The TSF design requirements should meet the following criteria:

- Provide permanent, secure containment of all tailings waste materials within an engineered disposal facility.
- Control seepage through the basin and embankments and allow for removal of free-draining liquids from the TSF during operations for recycling as process water to the maximum practical extent.
- Application of Best Available Technology (BAT) and Best Available Practices (BAP) for tailings containment;
- No surface water discharge to the environment over the life of the project.

The TSF is designed to permanently store tailings generated during the operation of the mine. The TSF will comprise of four zoned earth-rockfill dams (referred to as the North Embankment, East Embankment, South Embankment, and Southeast Embankment) and will be constructed using the downstream method of construction.

18.3.2 Evaluation and Design Framework

The evaluation and design of tailings facilities in British Columbia must now consider the recommendations from the Independent Expert Engineering Investigation and Review Panel Report on Mount Polley Tailings Storage Facility Breach (2015) as well as regulatory and standards of professional care required for mine waste impoundments. The Ajax TSF has been developed with consideration of the Mt. Polley committee's recommendations as documented in design reports as well as the Projects EA/EIS Application. The following table contains a summary of the recommendations along with a brief discussion of how each recommendation has been addressed during the evaluation and design process.

Table 18-1: Summary of Polley Recommendations

Panel Recommendations	Ajax Project Consideration
<u>*Best Available Technology for New Tailings Facilities*</u> *"BAT Recommendations BAT should be actively encouraged for new tailings facilities at existing and proposed mines. Safety attributes should be evaluated separately from economic considerations, and cost should not be the determining factor."*	Multiple evaluations were completed in order to identify the best available, site specific tailings technology for the Ajax Project. Supporting documents for EA/EIS and permitting include information on technical, environmental, social and economic aspects considered within the evaluations.
<u>*Best Available Technology for Closure*</u> *"BAT Principles should be applied to closure of active impoundments so that they are progressively removed from the inventory by attrition. Where applicable, alternatives to water covers should be*	Evaluations completed to identify best closure technology for the Ajax Project TSF included review and costing of a number of closure options. Work is documented in EA/EIS supporting documents.

aggressively pursued."	
<u>Corporate Governance</u> *"mining operations in B.C. proposing to operate a tailings storage facility (TSF) should either be required to be a member of MAC—ensuring adherence to the TSM—or be obliged to commit to an equivalent program, including the audit function."*	KAM will align with the Mining Association of Canada's "Towards Sustainable Mining" program Tailing Management Protocol and adopt the guidelines entitled Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities (2005), which provides useful guidance in documenting staff roles and management procedures.
<u>Corporate TSF Design Responsibilities</u> *"The Panel is of the view that the inclusion of these considerations and the declaration of Quantitative Performance Objectives (QPOs) are best incorporated early in project commitment at the bankable feasibility level."*	Performance objectives have been documented in the EA/EIS Application for the project for the following items: • TSF Construction and Tailings Deposition Plan • Tailings impoundment filling schedule • Construction schedule and ultimate crest length, maximum embankment height, ultimate foundation surface area, and total embankment fill volume • Construction and instrumentation monitoring Additional detail on performance objectives will be included in the *Mines Act/Environmental Management Act* Permit Application including: embankment performance instrumentation and monitoring trigger levels, construction material availability and scheduling to ultimate height of structures, and performance data gathering, interpretation, and reporting intervals.
<u>Potential Failure Mode Evaluation</u> *"The Panel would require a bankable feasibility study and related permit application to have considered all technical, environmental, social and economic aspects of the project. Resolution of technical and environmental considerations would usually be supported by proven methods, although technology development studies would not be precluded if they have advanced far enough to warrant implementation in practice. The bankable feasibility study would be of sufficient detail to support an investment decision that might have an accuracy of ±10%–15%.* *More explicitly, the bankable feasibility document would be required to contain the following:* *A detailed evaluation of all potential failure modes associated with:* *• The geological conditions of the site* *• The uncertainties associated with this evaluation* *• The role of the Observational Method to manage residual risk* *• Mitigation measures in case worse than anticipated conditions are encountered."*	The tailings dam design has been completed to a level of detail which meets or exceeds the panel's recommendations. The design evaluation has included examination of all potential failure modes as laid out by the Panel. A dam breach and inundation study was completed for the Ajax TSF and is documented in the Tailings Dam Failure Modes Assessment and Dam Breach and Inundation EA/EIS supporting documents. This analysis, utilizing site geological, hydrological, and topographic conditions considered potential mechanisms that could lead to a dam breach at different stages of operations and construction, assesses the likelihood of the failure occurring and the effects of such failure, and identifies potential risk reduction measures that could reduce breach potential. Mitigation opportunities were identified for each of the failure mode scenarios, which informed the development of the TSF design and monitoring objectives. The approach for management and monitoring for the TSF has subsequently been refined to greater level of detail than what was required for the EA/EIS Application, and this additional detail will be included in the *Mines Act/Environmental*

	Management Act Permit Application.
Independent Tailings Review Board (ITRB) "The appointment of IRTBs to provide third-party advice on the design, construction, operation and closure has become increasingly common and is recognized to provide value."	KAM has retained an Independent Tailings Review Board (ITRB) to review the design, construction, operation and closure of the Ajax TSF, and for ongoing advice on tailings operations/QPO to complement KAM's internal technical audit systems.

18.3.3 Design Basis & Operating Criteria

Design and operating criteria have been developed for the current design. The design criteria reflect the mine plan and operating strategy.

Considerations used in the development of the TSF design are summarized as follows:

- TSF and water management facilities located on KAM claims.
- Integration of mine rock release schedules from the KAM mining group.
- Annual staging of the TSF dam lifts allows for storage of subsequent years of tailings disposal, an operational pond volume of 2.4 Mm^3 and storage of the inflow design flood (IDF) during operations with sufficient freeboard for wave run-up and embankment settlement.
- Thickened tailings disposal with a tailings solids content of 60% by weight.
- TSF filling schedule based on the detailed mine schedule including material movements for dam construction and mine rock disposal.
- Water for the process plant sourced from the TSF supernatant pond with additional make-up water from Kamloops Lake as required.

The design and operating criteria for the TSF are presented in Table 18-2.

The North and East TSF dams are classified as "VERY HIGH" consequence category under the Canadian Dam Association's (CDA's) "Dam Safety Guidelines" (2014). According to CDA, the consequences of failure include potential loss of life of 100 or fewer and very high critical economic losses. Losses may include, but are not limited to, significant fish or wildlife habitat, infrastructure damage, loss of mining equipment, ore sterilization, and loss of tailings containment.

The South and Southeast TSF dams are classified as "SIGNIFICANT" consequence category. This classification shows that consequences of failure include a potential unspecified loss of life with no significant economic losses. Losses may include, but are not limited to, deterioration of fish or wildlife habitat, infrequently used transportation routes, and loss of tailings containment.

Table 18-2: Design & Operating Criteria for the Tailings Storage Facility

Item	Design Criteria
1.0 General	
Site Coordinates	50.591514, -120.411527
Site Elevation	Varies (934 - 1080 masl)
Codes and Standards	Health Safety and Reclamation Code for Mines in British Columbia (2008), Mines Act (RSBC 1996), ASTM, CDA Dam Safety Guidelines (2007) and related codes.
Mill Start-Up	Planned for January 2019

Item	Design Criteria
Climate	Mean Annual Precipitation = 336 mm/y
	Mean Annual Lake Evaporation = 579 mm/y
	Mean Annual Runoff = 26 mm/y
	Mean Annual Temperature = 6.4ºC
	Average annual snowfall = 101 mm
	Mean monthly wind speed = 2.3 m/s
	The predominant wind directions at the Mine Site are from the Southeast and Northwest
24-hour Rainfall Events	1 in 2 year 24-hour rainfall = 28 mm
	1 in 10 year 24-hour rainfall = 43 mm
	1 in 50 year 24-hour rainfall = 57 mm
	1 in 100 year 24-hour rainfall = 63 mm
	1 in 200 year 24-hour rainfall = 69 mm
	Probable Maximum Precipitation (PMP) = 219 mm
Snowpack and Snowmelt	1 in 100 year snowpack = 201 mm
2.0 Production	
Mine Production	Total Ore Milled = 440 Mt (~275 Mm^3) (November 2014 Mine Plan)
	Mill throughput = 65,000 t/d (@92% availability)
	Mine Life = 18 years
Mill Site Elevation	974 masl
3.0 Tailings Storage Facility	
TSF Dam Hazard Classification Consequence Category	The TSF was evaluated using EXTREME classification parameters as defined by the Canadian Dam Association (CDA) "Dam Safety Guidelines" (2007) although the current buttressed embankments are rated as “Very High” or “Significant”.
Seismic Design	Maximum Design Earthquake during Operations = 1 in 10,000 year return period event. Earthquake Magnitude = 7.3, EDGM = 0.293g
Storage Capacity	275 Mm^3
Start-up Pond	2.4 Mm^3
Tailings	Solids average dry density (t/m^3) = 1.6 t/m^3
Inflow Design Flood (IDF)	Probable Maximum Flood (PMF) = 72 hour PMP + 1 in 100 year snowpack - average annual snowpack = 447 mm
Design Freeboard	Sufficient freeboard to accommodate Inflow Design Flood above maximum supernatant pond level at each stage plus allowance for wave run-up protection
Dam Crest	39 m (This includes 35 m running width and 4 m for safety berms)
Seepage Control Measures	Till blanket comprised of natural low permeability glacial till materials in TSF basin
North Embankment Seepage Collection Pond 1	North Embankment Seepage Collection Pond 1
	Live storage capacity = 1 in 200 year event.
North Embankment Seepage Collection Pond 2	North Embankment Seepage Collection Pond 2
	Live storage capacity = 1 in 200 year event
East Embankment	Seepage routed to Central Collection Pond during operations
Starter Dam	Starter dam sized to provide approximately 24 months of tailings storage. Starter dam elevation 971 m.
Staged Expansion Construction Method	Starter embankment raise during first year of operations
	TSF embankments progressively raised during operations
	Downstream construction method
	Mine Rock Buttress for all stages of construction plus Mine Rock Storage Facility as per mine plan
Dam Fill Materials	Till blanket liner on upstream face of dam
	Geotextile with adequate granular sub-base
	Compacted Mine Rock
	Mine Rock Buttress
	Mine Rock Storage Facility
Geotechnical Instrumentation and Monitoring	Vibrating wire piezometers to measure pore water pressure dam and tailings
	Inclinometers
	Flow monitoring for embankment and foundation drains

Despite the differences in TSF dam consequence classifications, the TSF dams for the Ajax Project were designed for the most extreme events (i.e., "EXTREME" consequence category), which is the highest design standard defined by CDA Dam Safety Guidelines:

- IDF – Probable Maximum Flood Event (PMF) = 447 mm.
- EDGM – Maximum Credible Earthquake (MCE) = 0.293 g.

18.3.4 Construction & Operation

Prior to construction of the TSF Embankments, the embankment foundation and select areas of the TSF basin will be prepared for the earthwork dam construction. The following activities will be required for the preparation of the TSF Embankment foundation and TSF basin:

- Clearing and grubbing of the TSF Embankment footprint and select areas of the TSF basin,
- Stripping of topsoil and organics to stockpile, and
- Installation of the TSF Embankment rock drain system to the North Seepage Collection Ponds #1 and #2 including supply and installation of geofabric drain lining and drainage rock

Seepage through the embankment will primarily be controlled by the low permeability tailings mass, a till blanket liner on the upstream face of the embankment, and seepage cut-off structures along the upstream TSF toe.

The seepage management from the TSF includes the construction of several seepage collection ponds, water management ponds, and diversion ditches. Water management facilities (including diversion ditches and seepage collection ponds) are discussed in more detail in Section 18.5.

18.3.5 Embankment Construction

The TSF Embankments will be constructed to an ultimate elevation of 1,056 masl. The total fill requirement for tailings dam construction is 86 Mm^3, of which 4.6 Mm^3 will be used to construct the Starter North Embankment (Crest El. 971 masl). Initial construction material will be taken from a borrow source and will be constructed using a contractor fleet. The remainder of the embankment construction stages will be constructed using pit-run material.

The till blanket on the upstream face will be constructed from low-permeability glacial till material from nearby borrow sources or geosynthetic material if the local borrow material does not meet design construction specifications. The till blanket is intended to minimize seepage through the embankment. Prior to placement of this seepage control zone on the upstream face of the TSF, the foundation surface will include moisture conditioning and smoothing before installing a non-woven geotextile. The other embankment zones will include Compacted Mine Rock, Mine Rock Buttress and Mine Rock Storage Facility. These zones will be constructed from compacted earth fill and specified mine rock materials, either from a local borrow area or from open pit operations.

A TSF filling schedule was developed that shows the tailings mass balance or cumulative tailings volumetrics, freeboard for PMF, and wave-up and respective dam crest elevations to contain the water and tailings volumes on an annual basis; is provided in the filling schedule for the TSF on Figure 18-2.

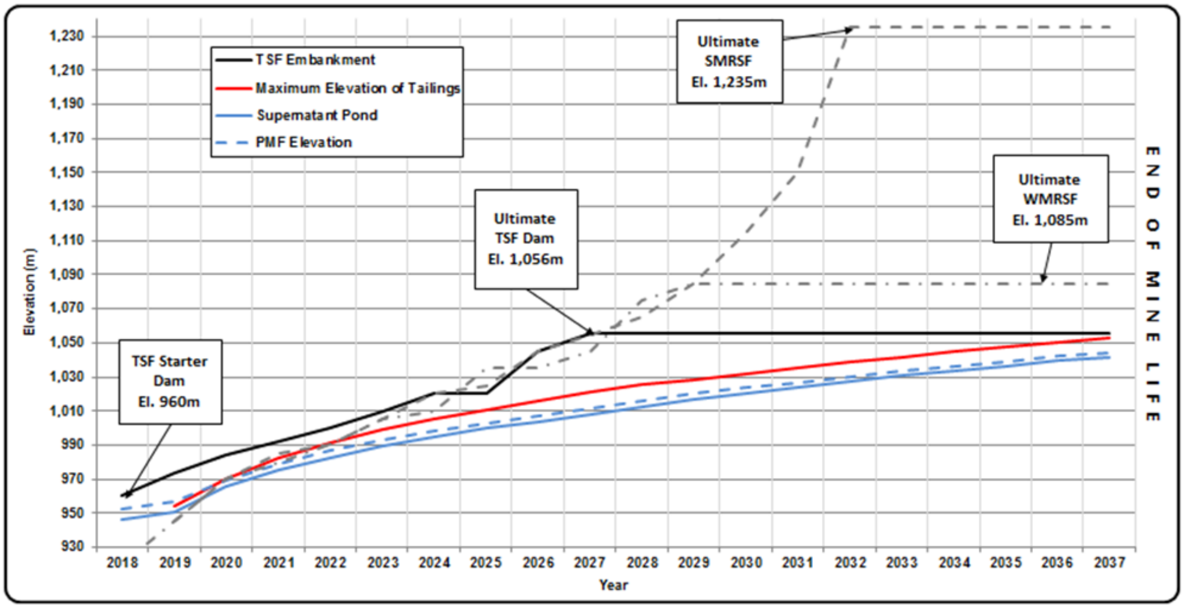


Figure 18-2: TSF Filing Schedule

18.3.6 Tailings Distribution & Reclaim System

A start-up water pond volume of approximately 2.4 Mm^3 is expected to be sufficient for the thickened tailings operation based on KAM's design criteria of a minimum 90 days of make-up water (Norwest, 2015). This water will be contained by the starter North Embankment. A trenched channel will be excavated within the basin (prior to plant site commissioning) to provide a surface water connection between Goose Lake and the TSF supernatant pond for the barge water recycle system, during the initial production years.

As tailings are deposited into the facility, water will be released from the tailings stream during deposition and subsequent consolidation and will eventually report as supernatant water to the main tailings pond. A small portion of the supernatant water will be lost due to evaporation, interstitial voids, and from seepage into the foundation. The remaining water will be available as recycle to the plant site. Deposition of tailings will be sequenced such that tailings beaches displace the supernatant pond to the south, away from the north embankment. Over time, the tailings will slowly infill the barge trench towards Goose Lake. The supernatant pond level will be maintained at a level that allows for on-going operation of the reclaim water barge. Normal tailings operations will see the lowermost portion of the tailings beach submerged below the supernatant pond. Water will be reclaimed through a floating pump barge, and pumped to a reclaim tank at a high point on the reclaim water line, where it will drain via gravity to the process plant. The reclaim water line will parallel the same service road being used by the tailings distribution pipeline corridor.

Reclaim and tailing water pipelines will be placed in a HDPE-lined containment trench that will direct potential leaks into TSF or emergency pond located at a low point of the corridor.

The tailings distribution and reclaim water systems are designed to convey tailings and reclaim water between the TSF and the plant site.

The tailings distribution system has three key components: a tailings pump station, tailings conveyance pressure pipeline and discharge spigots. Distribution of the tailings around the perimeter of the TSF is undertaken using two HDPE pressure pipeline alignments (North and South) which feed discharge spigots along the embankment crest. The discharge spigots facilitate tailings beach development within the TSF embankments. The tailings slurry shall be discharged via spigots from various points along the upstream crest of the starter dam or north embankment. The preliminary tailings deposition plan for the TSF is summarized as follows:

- Initial tailings slurry discharge shall be from the north and south abutments of the north embankment to develop the beaches at these locations first and reduce seepage gradients through the abutments.
- Tailings discharge points shall be moved as required to ensure the apex elevation of the deposition fan does not violate freeboard criteria.
- The method of tailings deposition (spigotting from perimeter) is expected to result in beaches with approximately 1 to 2% overall slopes. The actual tailings beach slope is expected to be steeper at the dam crest (near the deposition point) and flatter downslope. Beach slope angles will vary with solids content, discharge velocity, season, and the total height of tailings. Based on results from recent tailings laboratory testwork (KPL, 2015), it is expected that the slurry tailings at 60% solids content will consolidate relatively quickly in the TSF deposit to 77% solids content (with an estimated tailings density of approximately 1.5 to 1.6t/m^3). Periodic monitoring of beach slope angles and tailings characteristics will allow better prediction of future slope angles and allow for refinement of the tailings discharge plans over time.
- Supernatant pond water will be reclaimed from the TSF for use as process water for ongoing process plant operations throughout the life of mine.
- Trafficability of tailings will be poor where the tailings are saturated or nearly so. Access to the beach and pond areas shall be restricted.

18.3.7 Instrumentation & Monitoring

Geotechnical instrumentation will be installed along planes through the TSF embankments. The instrumentation will be installed during construction phases and monitored over the life of the project, and into closure. Geotechnical instrumentation is typically comprised of vibrating wire piezometers and slope inclinometers, and will be installed in the foundations and embankment fills.

Instrumentation monitoring will be routinely completed during construction, operations, and closure. Measurements during construction will be taken and analyzed on a routine basis to monitor the response of the embankment fill and the foundation from the loading of the embankment fill.

18.3.8 Water Management – General

The Water Management Plan (WMP) describes how water will be controlled and managed in and around the project area during construction, operations, reclamation, closure and long-term closure. The objectives of the plan are to manage water in a manner that supplements make-up water for ore processing while minimizing the potential for storm flows to cause damage to mine structures, and minimizing the potential for mining operations to cause adverse effects to downstream water quality. Water will be controlled to minimize erosion in areas disturbed by construction activities and prevent the release of sediment-laden water to the receiving environment. This includes diverting and/or collecting surface water runoff and seepage, establishing erosion and sediment control features, and managing pump back systems. The key facilities identified in the WMP are the:

- Tailings storage facility (TSF)
- Open pit
- Water management ponds
- Plant site, truckshop, and laydown areas
- Mine rock storage facilities (MRSFs)
- Ore stockpiles
- Jacko Lake and Peterson Creek.

The objectives, design elements and facilities included in the WMP, for the full life of the mine, from construction (pre-production) through to long-term closure, are described below.

18.3.9 Sediment & Erosion Control Plan

The construction water management strategy is to minimize disturbed areas and implement Best Management Practices (BMPs) as construction progresses. The sources of water during construction are as follows:

- Precipitation runoff from disturbed areas
- Groundwater from dewatering construction activities.

Activities that may require sediment and erosion control include clearing vegetation, stripping and stockpiling topsoil, and constructing roads and infrastructure. Potential hazards from these activities, in the absence of planned mitigation measures, include increased surface erosion from disturbed areas, increased sediment load to downstream receiving environments, and siltation or erosion of downstream watercourses or water bodies.

Sediment mobilization and erosion will be managed throughout the site by:

- Installing sediment controls prior to construction activities
- Limiting disturbance to the extent practical
- Reducing water velocity across the ground, particularly on exposed surfaces and in areas where flow tends to concentrate.

Installation of temporary erosion and sediment control features or BMPs will be the first step towards controlling sediment and erosion during construction. All temporary sediment and erosion control features will require regular maintenance. The temporary erosion and sediment control features associated with BMPs will be reclaimed after achieving soil and sediment stabilization.

Erosion control BMPs reduces erosion potential by stabilizing exposed soil or reducing surface runoff flow velocities. There are generally two types of erosion control BMPs that are used:

- Source control BMPs for protection of exposed surfaces

- Conveyance BMPs for control of runoff.

Experience and adaptive management are integral to the successful selection of the appropriate BMPs and the design and implementation of an overall erosion and sediment control plan. Erosion control BMPs are typically implemented during the construction phase, although they may also be implemented during operation, reclamation, and closure phases, as required, to minimize erosion and sediment discharge into surrounding areas.

18.3.10 Site Water Management

Specific water management elements that will be used where required throughout the site are described as follows:

- Pre-Production – Construction WMP which includes construction of several surface water collection ponds and their associated dams as well as contact and non-contact water channels.
- Operations – WMP for mine facilities from beginning of mine operations starting with pre-stripping activities during construction to the end of operations in Year 20 includes activities such as maintaining site erosion control BMP; establishing additional BMP's as required; constructing and operating water management ponds; and diverting a segment of the existing Peterson Creek via the Peterson Creek diversion system. Pumping and pipeline systems will be developed to redirect captured contact water for use as process make-up water or to the TSF supernatant pond.
- Reclamation – The primary objective of the reclamation and closure initiatives will be to transform the mine site into an integrated component of the surrounding ecosystem.
- Closure – The closure phase refers to the period after all site infrastructure, not required for ongoing water management activities, has been removed and the site has been reclaimed. Continued active management of surface runoff and seepage from the TSF and MRSFs will be required during the closure phase.
- Long-Term Closure – The long-term closure phase refers to the period when site runoff, with the exception of the water collecting in the open pit, meets discharge criteria and is discharged to the environment.

18.3.11 Open Pit Dewatering

Initial open pit dewatering includes removal of the existing pond, followed by ongoing dewatering activities that include:

- Groundwater inflows
- Pit depressurization
- Surface water runoff.

The initial dewatering of the existing pond will take place during the early phase of the construction activities. This water will be treated, as required, with clean water being used for construction water management activities including dust control, aggregate production (screening and crushing), and water required for earthworks construction.

Open pit dewatering is an on-going activity through the operations phase with the water pumped to the central collection pond. While pit seepage will vary throughout mine life, the open pit dewatering pumping system will be based on the estimated peak (design) seepage flow rate of 269 m^3/h.

18.3.12 Water Management Ponds

Seepage and mine contact runoff collection ponds will collect seepage and surface runoff from the TSF, open pit, MRSFs, and mine site infrastructure, prior to being routed to the TSF. The water management ponds have been sized to provide storage for seasonal runoff conditions and have storm water storage capacity for the 1 in 200 year, 24-hour storm event. Water collected in the water management ponds is intended to be utilized at the process plant as process water or stored in the TSF, depending on processing needs. Events exceeding the 1 in 200 year, 24-hour storm event will be discharged to the environment through engineered spillways. The ponds will be constructed of earthfill/rockfill materials, and may include low permeability basin liners, natural or synthetic, as required by site conditions. The water management ponds include the:

- North embankment seepage collection pond 1
- North embankment seepage collection pond 2
- Plant site drainage pond
- Central collection pond
- East mine rock storage facility (EMRSF) pond
- South mine rock storage facility (SMRSF) pond
- Peterson Creek diversion system and downstream pond.

18.3.12.1 North Embankment Seepage Pond 1

18.3.12.1.1 Volume

This seepage collection pond is located downstream of the north embankment along the natural valley drainage to the northwest of the downstream toe. Runoff from an estimated 2.7 km^2 catchment that extends southwards to the end of the south embankment will drain to the pond. The containment berm will be approximately 11 m high dyke with a crest length of approximately 280 m. The pond is sized for the area required for sediment removal during construction of the starter embankment. The elevation at which the required area can be met gives a storage volume of 119,000 m^3, which greatly exceeds the 1 in 200 year, 24-hour volume of 50,000 m^3.

18.3.12.1.2 Pumps & Pipelines

The north embankment seepage collection pond 1 seepage and surface runoff will be pumped directly to the TSF. Seepage pond 2 will discharge into seepage pond 1. Seepage pond 1 will pump the total seepage flows from the north embankment and surface runoff from the surrounding catchment to the TSF. The pipeline will be trenched beneath the frost penetration depth with a route outside of the ultimate TSF footprint to ensure it does not need to be moved throughout operations. A service road has also been provided to access the ponds, pumps and pipelines for maintenance or repair.

18.3.12.2 North Embankment Seepage Pond 2

18.3.12.2.1 Volume

This seepage collection pond is located downstream of the north embankment along the natural valley drainage to the northeast of the downstream toe. The containment berm will be approximately 21 m high dyke with a crest length of approximately 107 m. The pond is sized for the area required for sediment removal during construction. The elevation at which the required area can be met gives a storage volume of 129,900 m^3, which greatly exceeds the 1 in 200 year, 24-hour volume of 10,000 m^3.

18.3.12.2.2 Pumps & Pipelines

The north embankment seepage collection pond 2 seepage and surface runoff will be pumped directly to seepage pond 1. The pipeline will be trenched beneath the frost penetration depth with a route along the service road. The service road will be provided to access the ponds, pumps and pipelines for maintenance or repair.

18.3.12.3 Plant Site Drainage Pond

18.3.12.3.1 Volume

This plant site drainage pond is located north of the plant site. Surface water runoff collected on the plant site area will be directed by a system of ditches and culverts to the unlined pond. Class 3 effluent from the plant site sewage treatment plant will also report to this pond. The pond capacity of 12,100 m^3 is sized such that it exceeds the volume required to contain a 1 in 200 year, 24-hour volume.

18.3.12.3.2 Pumps & Pipelines

Water collected in the plant site drainage pond will be pumped in a dedicated pipeline to the thickener de-aerator feed tank located at the plant site. The pipeline will be trenched below the frost penetration depth for a portion of the length with a route that utilizes a pipe rack on the coarse ore conveyors to reach the thickener (under slung on the conveyor). Once discharged to the thickener, the water will be recycled to the plant or further pumped to the TSF via the tailings pumps.

18.3.12.4 Central Collection Pond

18.3.12.4.1 Volume

The central collection pond is located and shaped to minimize earthworks associated with obtaining the minimum capacity required. The pond will collect surface runoff from its surrounding catchment for a 1 in 200 year, 24-hour storm volume as well as water collected from open pit dewatering with adequate freeboard. The central collection pond has a capacity of 81,400 m^3 and will be lined.

18.3.12.4.2 Pumps & Pipelines

Water collected in the central collection pond will be pumped in a dedicated pipeline to the thickener de-aerator feed tank located at the plant site. There will be a single pump station with two independent pump sets inside. Both will utilize the same dedicated pipeline. Each pump set will have a separate duty, specifically:

- Pump Set 1: will handle normal operation flows (continuous flows, in this instance, the open pit dewatering flows).
- Pump Set 2: will handle the normal operation flow, plus the 1 in 200 year, 24-hour storm event volume pumped out over a three-day period.

The pipeline will be trenched below the frost penetration depth with a route following the coarse ore conveyor, passing along the south side of the plant site (avoiding buried services within the plant site) rising above ground at a specified location to run along the thickener pipe rack and into the thickener. Other water management pipelines are combined in the same trench where possible to optimize trenching quantities. In this case, sections of this pipeline will combine with the EMRSF pond discharge pipeline. Once discharged to the thickener, the water will be recycled to the plant or further pumped to the TSF via the tailings pumps.

18.3.12.5 EMRSF Pond

18.3.12.5.1 Volume

The EMRSF pond is located downstream of the EMRSF and will contain: direct precipitation on the pond and catchment runoff, seepage/runoff from the EMRSF, runoff from the truckshop area, and Class 3 effluent from the truckshop sewage treatment. The pond has a dam with and approximate height is about 12 m. As the pond is situated partially on the Peterson Creek Aquifer, the pond will require a geosynthetic liner. The pond will have an under liner drainage system to a water testing well for the purpose of leak detection. As the pond is located on a slope, a dam will need to be constructed to retain the water. This dam will be designed to contain the runoff associated with a 200-year return period, 24-hour rainfall event and will include a spillway sized for the 200-year peak instantaneous flow.

Non-contact water diversion channels and an underdrain system have been incorporated into the EMRSF water management system in order to reduce the flows being directed to the pond. Non-contact water flows will be diverted around the EMRSF pond and discharged into Peterson Creek.

18.3.12.5.2 Pumps & Pipelines

Surface runoff from the east mine rock storage facility will be collected via ditches. Water collected in the EMRSF pond will be pumped in a dedicated pipeline to the thickener de-aerator feed tank located at the plant site. The pipeline will be trenched below the frost penetration depth with a route following the coarse ore conveyor, passing along the south side of the plant site (avoiding buried services within the plant site) rising above ground at a specified location to run along the thickener pipe rack and into the thickener. Other water management pipelines are combined in the same trench where possible to optimize trenching quantities. In this case, sections of this pipeline will combine with the central collection pond discharge pipeline. Once discharged to the thickener, the water will be recycled to the plant or further pumped to the TSF via the tailings pumps.

18.3.12.6 SMRSF Pond

The SMRSF Pond is a small water containment facility which will be excavated into the natural slope on the eastern side of the SMRSF. The pond will be lined and will capture run-off from a relatively small catchment including a portion of the SMRSF and a portion of the tailings and make-up water pipeline corridor. The pond has been sized for capacity for the 1:200 year storm event. Water from this pond will be pumped in a dedicated pipeline to the thickener de-aerator feed tank located at the plant site. Once discharged to the thickener, the water will be recycled to the plant or further pumped to the TSF via the tailings pumps.

18.3.12.7 Peterson Creek Diversion System and Downstream Pond

18.3.12.7.1 Purpose & Objectives

Water management plan for the Jacko Lake dams and the Peterson Creek downstream pond dam are required for the development of the open pit. It is planned to construct these facilities prior to the start of mine production.

The water management plan for Jacko Lake and Peterson Creek includes engineered dams on Jacko Lake, a diversion system and a new pond within Peterson Creek. The water management plan seeks to address the following key objectives:

- Facilitate removal of the existing Kinder Morgan Canada's Trans Mountain gas pipeline during the construction phase which will assist development of the open pit
- Upgrade existing Jacko Lake facilities and provide design flood storage during mine operations
- Divert water from Jacko Lake around the open pit area, discharging downstream into Peterson Creek during operations
- Supply water to downstream water license holders during operations.

Engineered dams will be constructed on the western, northeastern and southwestern arms of Jacko Lake with allowance for an emergency spillway on the southeast arm to divert unforeseen floodwater into the open pit area. The normal water level of Jacko Lake will be maintained at an elevation of 892.0 m using a diversion pumping system (Peterson Creek diversion system). The purpose of the dams is to manage stormwater that causes the lake to rise above the normal water level of 892.0 m during large rainfall/runoff events. During mining operations, excess runoff into Jacko Lake will be diverted around the open pit using the Peterson Creek diversion system. Flow from the Peterson Creek diversion system diversion system will be conveyed into a new pond downstream of the outlet structure and into Peterson Creek downstream pond.

Peterson Creek downstream pond comprises a lined impoundment and dam structure with a capacity of 68,000 m^3. The dam is a compacted fill structure with an emergency spillway channel on its north side that discharges into Peterson Creek. A low level decant provides flow control for downstream licensees.

18.3.12.7.2 Pumps & Pipelines

The Peterson Creek diversion system (designed by Fluor) intakes water from Jacko Lake (west of the open pit) and pumps it via a dedicated pipeline following the site main access road. The pipeline is trenched beneath the frost penetration depth combined for the majority of the route length with the incoming fresh water line that feeds plant facilities. The pipeline will run through the haul road underpass tunnel and discharge into Peterson Creek using an energy dissipation facility to prevent erosion scour.

This system will have a pump station designed and located to minimise its effect on the natural Jacko Lake system. There will be a single pump station with two independent pump sets inside. Both will utilize the same dedicated pipeline. Each pump set will have a separate duty, specifically:

- Pump Set 1 will handle normal operation flows. These are seasonally variable flows maintaining downstream water license holders during operations, drawing only from water above the conservation level.
- Pump Set 2 will handle the 1 in 200 year, 24-hour storm event volume pumped out over a three-day period. The pump station will prevent overflow of Jacko Lake that could potentially cause flooding downstream mine infrastructure.

18.3.13 Site-Wide Water Balance

A mine site water balance was created BGC Engineering Inc. (BGC) to simulate the construction, operations, reclamation and closure periods of the project using a monthly time step, and incorporating all the mine site facilities.

The average monthly deficit during operations is expected to be 600,000 m^3 (820 m^3/h), under median climatic conditions. The maximum monthly deficit is expected to be 880,000 m^3 (1,200 m^3/h), under abnormally dry conditions; while the minimum monthly deficit is expected to be 330,000 m^3 (460 m^3/h), under abnormally wet conditions.

18.3.14

Construction of the TSF and the associated buttress and mine rock storage facilities has been integrated with the mining and mineral processing schedules over the mine life. Figure 18-3 through Figure 18-5 show the sequence of development of the TSF and its mine rock buttress along with the tailings placement for the 1, 10 and end of mine life configurations. The development of the TSF and buttress are scheduled so that the TSF capacity is maintained a year ahead of the tailings placement until the final years of mine life when full embankment height is reached.

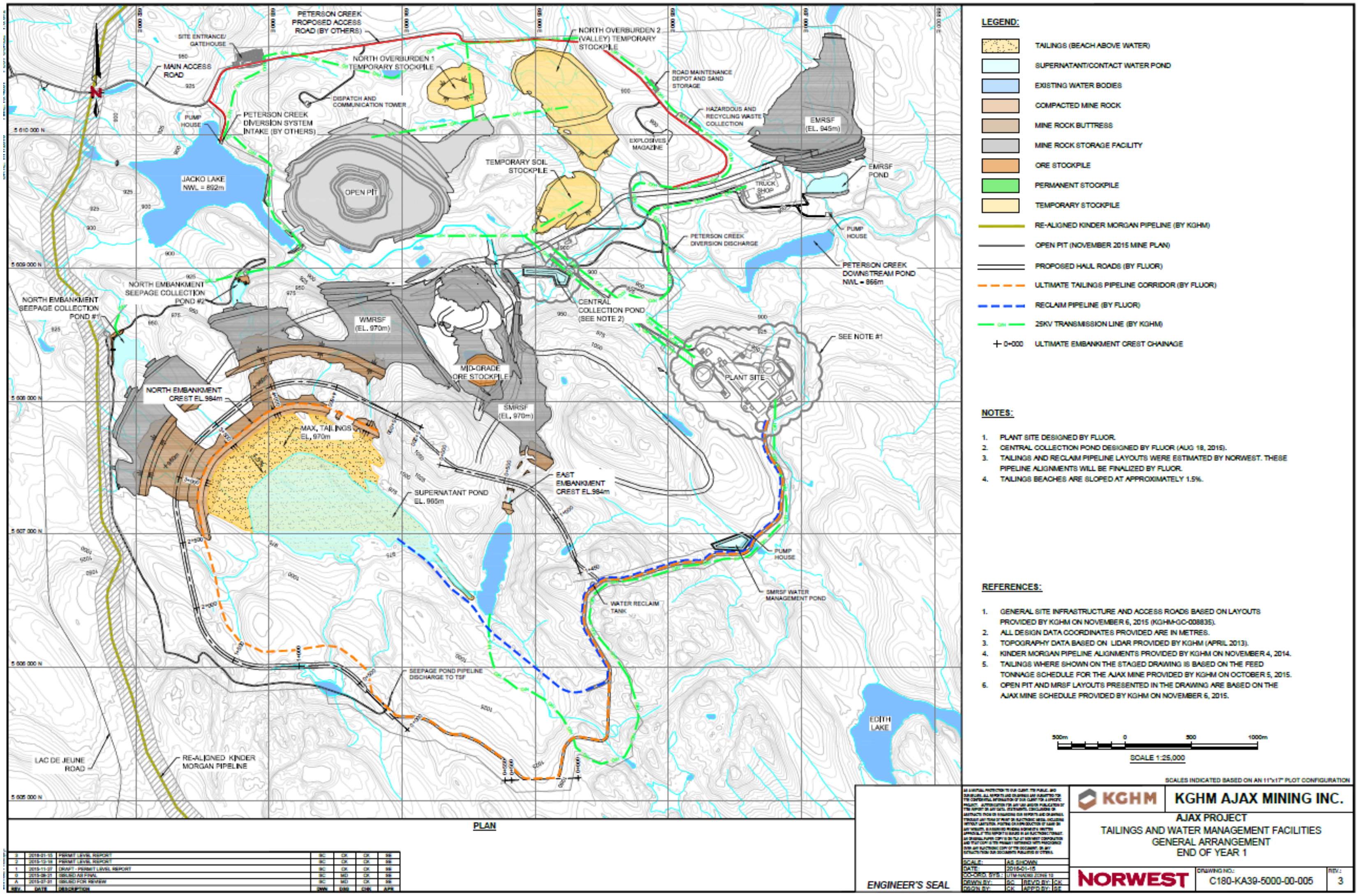


Figure 18-3: TSF End of Year 1

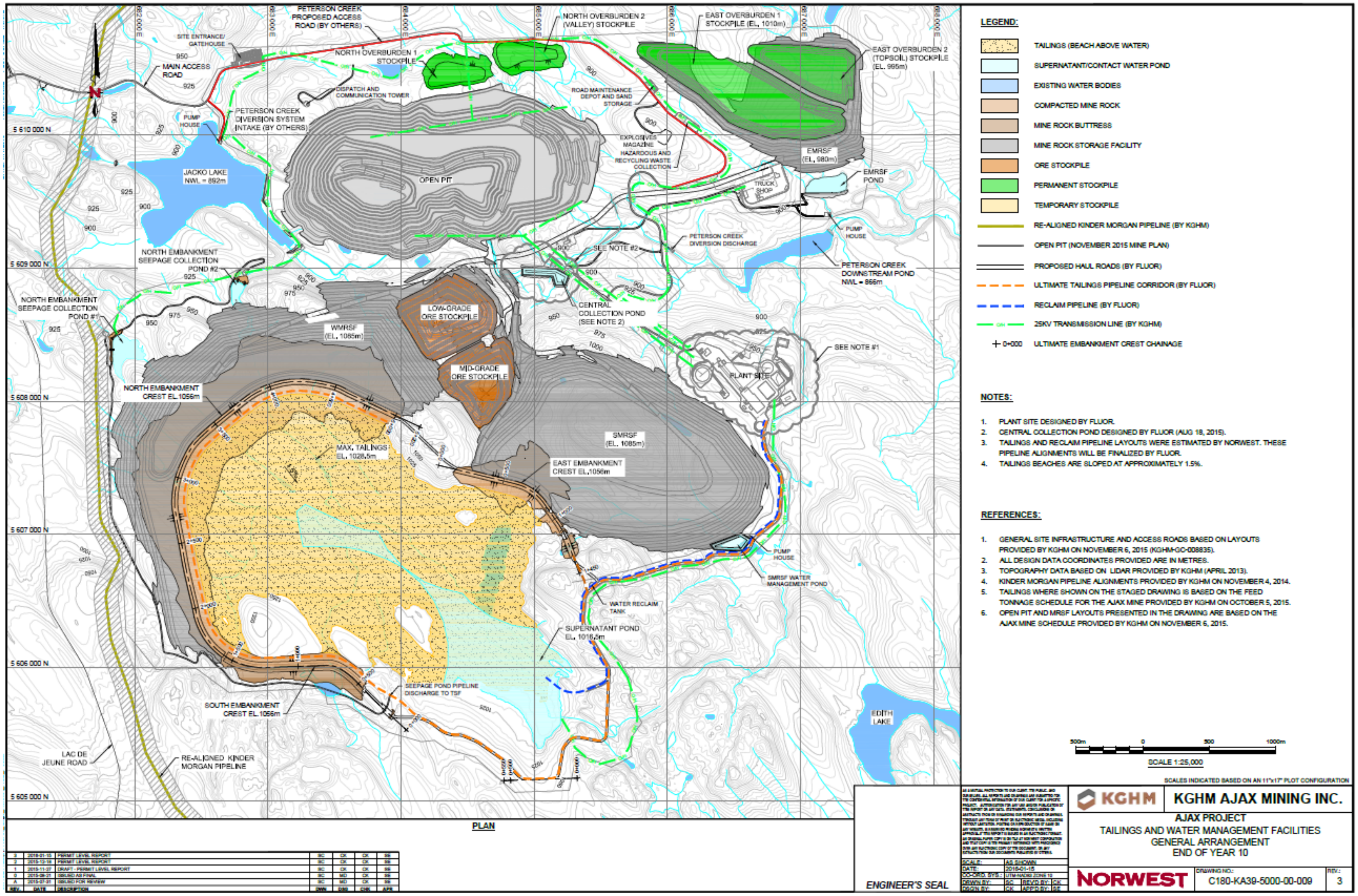


Figure 18-4: TSF End of Year 10

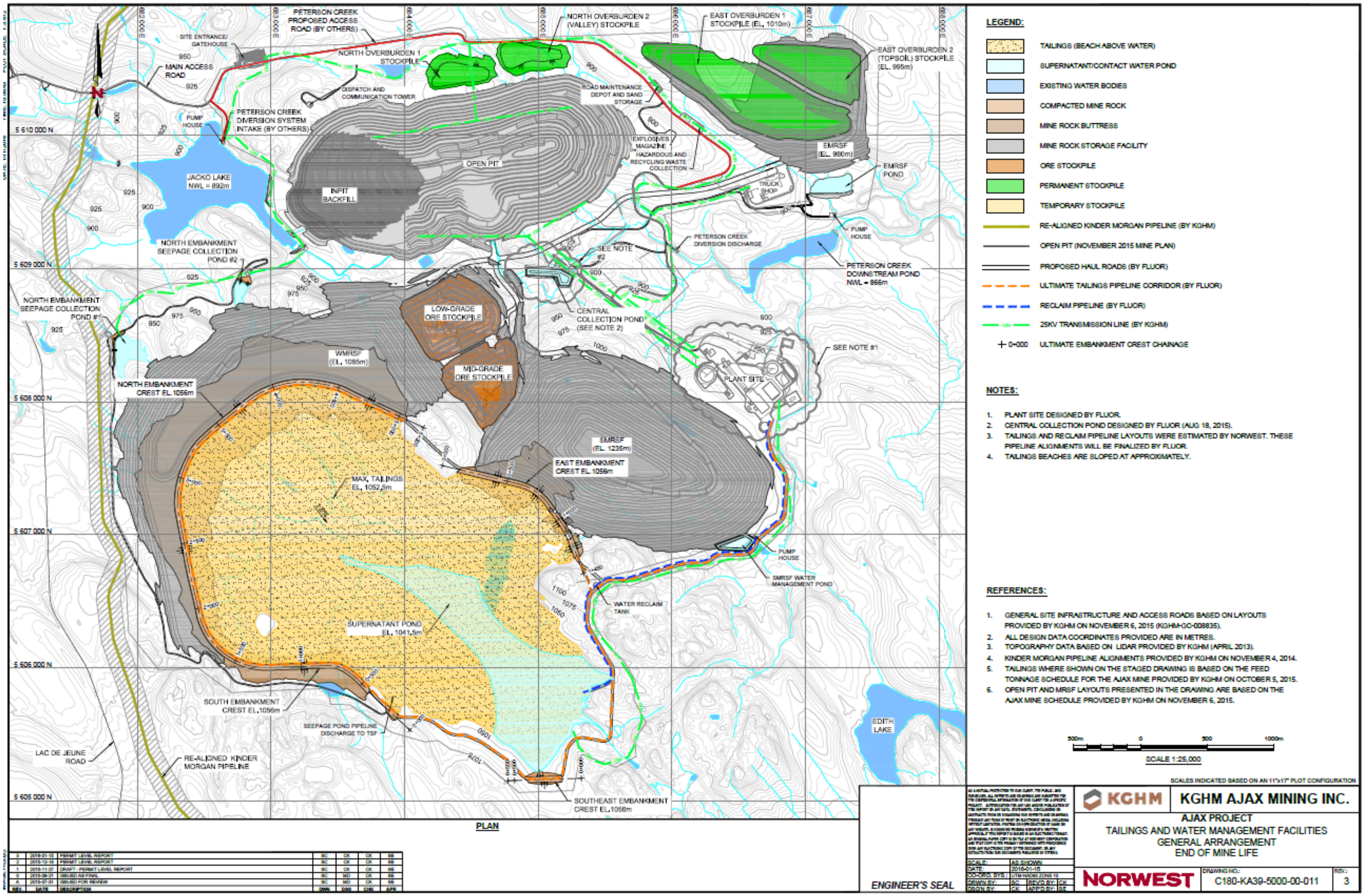


Figure 18-5: TSF End of Mine Life

18.4 Buildings & Facilities

The Ajax Project is primarily green field site with some areas of historic mine rock storage facilities from the previous Teck mining operations. Existing site infrastructure is limited to existing access onto the historic mine haul road off Lac Le Jeune Road.

Some areas of the project site are also currently accessible from Goose Lake Road. The new facilities and infrastructure for the project will include:

- access and site roads
- fresh water supply
- power supply and distribution
- water management
- mining and mining related maintenance facilities
- ore handling and processing facility
- tailings storage facility
- common project infrastructure.

18.4.1 Design Basis

Geotechnical site investigation was performed in 2014 for the project site by Knight Piésold.

All facility foundations have been designed based on the bearing capacities and soil parameters provided in this report, which are summarized in Section 18.2.

A final geotechnical study will be completed for detailed engineering. This should be based on the actual and definitive plant layout and include boreholes and soil testing for all major structures.

All exposed subgrade will be reviewed by a qualified geotechnical engineer prior to placement of concrete to verify that the subgrade conditions are consistent with those assumed.

Conventional positive drainage away from structural foundations will be created both during construction and after completion. During construction, excavated ground to the underside of footings should be cleaned and loose material removed prior to steel reinforcement and concrete placement.

Structural quantities in the following areas have been estimated based on current mechanical, process and civil general arrangement drawings:

- Primary crushing
- Coarse ore stockpile and reclaim
- Secondary and tertiary crushing building
- Fine ore stockpile and reclaim
- Conveyor support structures with drive stations and take-ups (foundations only)
- Process plant building

- Tailings thickening
- Administration building foundation
- Gatehouse foundation
- Truck shop/warehouse
- Truck scale foundation
- Reagents storage building foundation
- Assay and metallurgical laboratory foundation
- Storage building foundation
- Potable water treatment plants foundations
- Fresh water booster station no. 2 foundation
- Miscellaneous pump houses foundations
- Main substation – E-house and transformers
- Main substation – harmonic filter foundations
- Modular electrical buildings and transformers – various locations
- Sewage treatment facilities
- Water storage tanks
- Fire protection pump houses.

There was no allowance made for over-pour or wastage in the concrete quantities take-off. All concrete is based on a 28-day compressive strength of 30 MPa. Excavation quantities are taken to rough grade or underside of foundation.

In the architectural design criteria for buildings there are two major categories; process buildings and support infrastructure buildings. Process type buildings are sized based on equipment layouts received from plant design and material handling disciplines. The support infrastructure buildings are designed based on latest client organization chart, operational needs, and past similar projects.

Process spillage containment will be designed at 1.1 times of its tank or vessel volume. There are some specific considerations with this regard applied to a few of major process areas:

1. Grinding area: the containment is designed such that it can hold any pump box's surge or drain under normal operation. During an emergency event, the excessive water can passively overflow to the outdoor emergency pond via a pipe without flooding the pumps or motors.
2. Rougher flotation tailings pump box's area: the containment is designed such that it can hold any surge or drain to a maximum volume of 1.1 times of one largest tank (300 m^3) within the plant. Any excessive water can passively overflow to the emergency pond via a pipe without flooding the pumps or motors.
3. Cleaner and concentrate area: the containment is designed such that it can hold any surge or drain in the plant without a need to discharge outside.

4. Tailings thickener area: the containment is designed such that it can hold any minor spillage from the thickener or the underflow pipes. During an emergency event, all of slurry in the thickener and underflow tailings pipeline can be drained to the emergency pond through an emergency drainpipe with the largest design flow from a failed thickener underflow line or valve.
5. Process water tank area: there will be no containment required in this area. Its high location and the design allows any spillage or overflow from this tank flows by gravity toward TSF.

18.4.2 Ore Handling & Processing Facility

18.4.2.1 Primary Crushing

The primary crusher station will be located on the southeast edge of the mine pit, approximately 150 m from the mine pit rim limits. It will comprise a main concrete based tower housing the gyratory crusher, a stick built steel service tower for ancillaries, and a stick built steel dust enclosure covering the top of the dump pocket. The concrete tower will be a reinforced monolithic design with multiple levels to accommodate the needs and functions of each level. Areas of high wear such as dump pockets and discharge openings will receive special protection by way of abrasion resistant steel liners.

A mechanically stabilized earth (MSE) wall will create a bench for the haul truck dump operations forming a face 30 m deep. The area behind the MSE wall will be backfilled to provide the level haul truck bench. In order to reduce earthworks and MSE wall quantities, the station has been situated in a gentle down-sloping shallow valley.

The level upper bench created by the MSE wall will be used for mine haul truck traffic and access to the primary crusher ROM dump pocket from the pit haul road. The bench and the dump pocket will be designed for a twin dump operation of 300 tonne haul trucks transporting ROM ore from the mine pit. Space for a ROM stockpile will be located at the northeast corner of the bench.

The dump pocket will be of concrete construction, partially lined with 50 mm thick abrasion resistant steel and will form part of the primary crusher station structure. It will have a live capacity of 450 tonnes of ROM ore (one and a half dumps from haul trucks). The approach to the dump pocket will be provided by two compacted gravel truck aprons 14 m wide by 20 m long flanking each side of the dump pocket. The top of each dump pocket wall adjacent to the truck apron will be reinforced with an embedded steel plate forming a 45° bumper to prevent the haul trucks from backing into the dump pocket. The design of the bumper will be based on a maximum truck backing up speed of 5 km/h. The side of the area adjacent to the crest of the MSE wall will be protected by safety berms.

The ROM dump pocket will be covered with an unheated dust enclosure. This will be a 23 m high steel structure with braced space frame, purlins and girts covered with non-insulated metal cladding roof and walls. Large rubber curtain doors will contain dust egress and allow the continuous entry and exit of haul trucks for the dumping operations. Wing walls extending from the sides of the door openings will provide rock fall protection to the building walls and the lower bench.

The enclosure will extend to the rear of the dump pocket to also cover a 14 m long by 14 m wide maintenance area for mainshaft mantle liner replacement. This maintenance area will have a compacted gravel floor and will be separated from the dump pocket area by a wall with a 20 m high by 11 m wide sliding hangar style door. Negative pressure created by the dump pocket dust collection system will ensure that dust egress into the maintenance area is minimal. A 120 tonne jib crane (2110-JIB-0005) will reach through the door into the dump pocket to allow removal of the mainshaft to the maintenance area.

Dust control system is provided for crusher dump and crusher discharge areas. Heating and ventilation system is provided for compressor room, lubrication room and mechanical room which houses crusher lube system. Fire protection system includes dry pipe sprinkler system for coarse ore feed conveyor inside the tunnel, lubrication room and portable fire extinguishers protection in other key areas.

The crusher building will be illuminated with high-pressure sodium wall and ceiling mount fixtures inside the building. High mast LED floodlights around the structure and general traffic areas will allow continuous 24-hour mine truck operations.

A modular operator's control room will be located at the top of the steel service tower steel peeking into the dump pocket through a sealed opening through the dust enclosure wall. The control room will have shatterproof glass windows to overlook the trucks and dump area and will facilitate control and monitoring of the process and other activities. The control room will be a 5 m wide by 5.7 m long and 3 m high steel structure with non-combustible insulated metal cladding roof and walls. The building will be electrically heated, have toilet facilities, and be equipped with both fire protection and detection systems.

A sump in the corner on the bottom level (conveyor level) of the primary crusher station will collect any water in the area from wash down or weather. This sump will be piped for gravity draining to the nearby central collection pond.

The toilet facilities of the control room will be serviced only by fresh water. No potable water will be available in the primary crusher station. A refillable water dispenser will be provided for drinking. Signage will be posted at the toilet facility sink that faucet water is not for consumption.

In addition, sanitary systems will not be available at the primary crusher area. The toilet in the control room will be plumbed to a local septic tank. Waste collected in the septic tanks will be trucked to sewage treatment.

Air utility stations, power and welding receptacles will be installed in areas where maintenance will be performed.

18.4.2.2 Coarse Ore Stockpile Cover & Reclaim Tunnel

The coarse ore stockpile will be completely enclosed by a geodesic type dome cover that will prevent dust emissions from the stockpile into the environment. This cover will be 116 m in diameter and will be supported on a 1 m high concrete ring wall foundation. The bench will generally extend out 10 m around the ring wall to allow dozer and mobile equipment access around the cover. Two 5 m high by 7 m wide overhead doors on opposite sides will allow vehicle entry into the dome cover.

A platform suspended from the top of the cover will provide access to the incoming feed conveyor's head end. A sliding connection between the platform and conveyor truss will transfer vertical loads to the dome cover for support of the conveyor. A 20 tonne electric hoist and monorail combination over the platform will facilitate conveyor head pulley maintenance.

The shell will be covered with non-combustible non-insulated metal cladding with partial translucent panels for natural light. High-pressure sodium lamps will provide additional lighting inside the cover.

No dust collection will be provided inside as the cover will essentially seal the stockpile from the environment. Two exhaust fans will be installed in the cover to allow ventilation of mobile equipment exhaust.

There will be no fire suppression systems under the cover. Portable fire extinguishers will be provided in key accessible areas.

The coarse ore reclaim tunnel will be of exterior dimensions of 10.0 m wide x 63.0 m long and 12.0 m average height and centred under the base of the stockpile. An intermediate floor in the tunnel will create an upper chamber that will hold four reclaim apron feeders with the cone crusher screen feed conveyor no. 1 located on the bottom chamber.

The structure will be a reinforced concrete construction with a 1.8 m thick mat foundation, 1.5 m thick walls, and a 2.2 m thick concrete roof. The roof will be provided with four in-line reclaim openings spaced at 13 m centres for gravity feed of the apron feeders. The openings will be constructed with embedded steel plate inserts and protected with abrasive-resistant steel liners to minimize the effects of wear.

The intermediate concrete floor 0.75 m thick, spanning between the sidewalls, will support the apron feeders. Openings will be provided in the floor for apron feeder discharge and dribble chutes and for stairs at the back end and a ladder at the front. Where required, handrails will surround openings to maintain safety.

The upper portion of the front wall of the upper chamber will be left open during construction to allow for feeder installation. The construction opening will be closed with a precast concrete panel or treated wood wall before backfilling around this end. Monorail beams will be attached to the underside of the reclaim chamber roof to service the feeders on the floor.

The lower chamber will hold the tail end of the cone crusher screen feed conveyor no. 1. A circular steel multi-plate structure of 5.5 m diameter and 55 m length will facilitate the transition from the lower chamber of the reclaim tunnel to the outside. Both the reclaim and multi-plate tunnel will have sufficient space on one side for passage and clean-up by a skid steer loader. Reinforced concrete will make up the floor of the multi-plate tunnel.

The rear wall of the lower chamber will contain the entrance to the coarse ore reclaim escape tunnel. The escape tunnel will also be of steel multi-plate construction with an inside diameter of 2.4 m with reinforced concrete floor. It will run 33 m south underground and lead to an exit stairway structure to ground level, which ends at the coarse ore reclaim escape tunnel exit enclosure just outside the stockpile cover.

The escape tunnel, bottom floor of the concrete reclaim tunnel, and the multi-plate tunnel will all be sloped at 1% to allow gravity drainage of water towards the front of the tunnel. As such, a sump inside the tunnel will not be required.

Lighting will be provided by high-pressure sodium lighting fixtures within the tunnels. The reclaim tunnel will have dust control, ventilation and dry pipe sprinkler system and portable fire extinguishers will be provided for fire protection.

18.4.2.3 Secondary & Tertiary Crushing Building

The secondary and tertiary crushing building will be a conventional stick built steel structure with 2% slope standing seam metal roof panel over exposed laminated insulation and metal wall panels over exposed laminated insulation. Insulation on the interior walls will be protected with a liner metal panel up to the height of man doors. A 120-tonnes and 25-tonnes overhead crane will be supported off the main building columns and the building columns will be supported on strip footings. The building will have a perimeter grade wall and a ground floor slab will be provided throughout. Equipment will be supported on interior foundations independent of the building frame. Steel platforms with multiple levels where required will be provided around equipment for maintenance complete with required egress and stair or ladder access.

The HPGR and cone crushers will be supported on heavy concrete mat foundations with reinforced concrete piers, walls and elevated slabs as required. The surge bins and screens feeding the crushers will also be supported on mat foundations and provided with multiple levels of platforms for maintenance. Stair or ladder access will be provided to various levels around the bins for maintenance as well as to the head-end platforms supporting the feed conveyors.

An extension on the west side of the building will enclose a maintenance area for assembly and disassembly of the HPGR rolls. This area will also serve a maintenance area for the cone crushers. This will house a 120-tonnes half gantry crane that will allow the lifting and transporting of HPGR rolls and other spares into the main building. This area is to be separated from the main building by a retractable door for dust control.

The secondary and tertiary crushing building will have dust control system for cone crusher, HPGR area and heating and ventilation system for the building including unit heaters. Fire protection system includes standpipe hose system, sprinkler system for lube rooms and conveyors and portable fire extinguishers.

A modular control room and lunchroom is located outside and adjacent to the main building with approximate size of 9.75 m x 3.65 m. The control room will house two operators. The lunchroom is designed with capacity of six people and will have washroom. The modular building will be supplied with potable water. Heating, ventilation and air conditioning system is provided for control and lunchroom.

18.4.2.4 Fine Ore Stockpile Cover & Reclaim Tunnel

Similar to the coarse ore stockpile, the fine ore stockpile will also be completely enclosed by a geodesic type dome cover, which will prevent dust emissions from the stockpile into the environment. This cover will be 93 m in diameter and will be supported on a 1 m high concrete ring wall foundation. The bench will generally extend out 10 m around the ring wall to allow dozer and mobile equipment access around the cover. Two 5 m high by 7 m wide overhead doors on opposite sides will allow vehicle entry into the dome cover.

A platform suspended from the top of the cover will provide access to the incoming feed conveyor's head end. A sliding connection between the platform and conveyor truss will transfer vertical loads to the dome cover for support of the conveyor. A 5 tonne electric hoist and monorail combination over the platform will facilitate conveyor head pulley maintenance.

The shell will be covered with non-combustible non-insulated metal cladding with partial translucent panels for natural light. High-pressure sodium lamps will provide additional lighting inside the cover.

No dust collection will be provided inside as the cover will essentially seal the stockpile from the environment. Two exhaust fans will be installed in the cover to allow ventilation of mobile equipment exhaust.

There will be no fire suppression systems under the cover. Portable fire extinguishers will be provided in key accessible areas.

The fine ore reclaim tunnel will be of exterior dimensions of 9.4 m wide by 52 m long by 12.4 m average height centred under the base of the stockpile. An intermediate floor in the tunnel will create an upper chamber that will hold three reclaim apron feeders with the HPGR feed bin conveyor located on the bottom chamber which will have a floor inclined at 2° to match the conveyor profile. As such, the reclaim tunnel will vary in height from 11.55 m at the front of the tunnel to 13.25 m at the rear.

The structure will be of reinforced concrete construction with a 1.6 m thick mat foundation, 1.2 m thick walls, and a 2.2 m thick concrete roof. The roof will be provided with three in-line reclaim openings spaced at 13 m centres for gravity feed of the apron feeders. The openings will be constructed with embedded steel plate inserts and protected with abrasive-resistant steel liners to minimize the effects of wear.

The intermediate concrete floor of 0.75 m thick, spanning between the sidewalls, will support the apron feeders. Openings will be provided in the floor for apron feeder discharge and dribble chutes and for stairs at the back end and a ladder at the front. Where required, handrails will surround openings to maintain safety.

The upper portion of the front wall of the upper chamber will be left open during construction to allow for feeder installation. The construction opening will be closed with a precast concrete panel or treated wood wall before backfilling around this end. Monorail beams will be attached to the underside of the reclaim chamber roof to service the feeders on the floor.

The lower chamber will hold the tail end of the HPGR feed bin conveyor. A circular steel multi-plate structure of 6.7 m diameter and 44 m length inclined also at 2° will facilitate the transition from the lower chamber of the reclaim tunnel to the outside. Both the reclaim and multi-plate tunnel will have sufficient space on one side for passage and clean-up by a skid steer loader. Reinforced concrete will make up the floor of the multi-plate tunnel.

The rear of the lower chamber will contain a sump and also the entrance to the fine ore reclaim escape tunnel. The escape tunnel will also be of steel multi-plate construction with an inside diameter of 2.4 m with reinforced concrete floor. It will run 72 m underground and lead directly to the fine ore reclaim escape tunnel exit enclosure outside to the north of the stockpile cover. The escape tunnel will have a constant slope of approximately 7%. Water collected in the sump of the reclaim tunnel will be routed through the escape tunnel to gravity drain to the outside, ultimately reporting to the Plant Site Water Management Pond.

Lighting will be provided by high-pressure sodium lighting fixtures within the tunnels. The reclaim tunnel will have dust control, ventilation and dry pipe sprinkler system and portable fire extinguishers will be provided for fire protection.

18.4.2.5 Process Plant Building

The process plant building will be a conventional steel frame stick built structure with structural steel roof trusses, and 2% slope standing seam metal roof panel over exposed laminated insulation. The exterior wall will be metal wall panels over exposed laminated insulation. Insulation on the interior walls will be protected with a liner metal panel up to the height of man doors. Elevated floors will be grating or concrete on metal deck supported on steel framing. The lateral load resisting system will consist of braced steel frames in combination with steel moment resisting frames.

Overhead cranes will service dedicated process areas with capacities suitable for the removal and maintenance of the heaviest replaceable components of the equipment. Overhead cranes will be supported off the building main columns and include the following:

- Screening Bay .... 50 tonnes
- Grinding Bay .... 70 tonnes / 10 tonnes
- Cyclone Bay .... 25 tonnes
- Flotation Bay .... 25 tonnes / 5 tonnes
- Regrind and Dewatering Bay .... 50 tonnes / 5 tonnes
- Tailings Annex .... 20 tonnes

Structurally, the process plant building will comprise two independent sections (grinding and flotation/concentration areas), separated by an expansion joint to allow for the full potential sway motion and thermal expansion.

Each section will be a braced space frame. The stick-built structural steel space frame building will consist of lateral moment frames with roof trusses, longitudinal bracing and horizontal bracing roof diaphragm. Step columns and brackets off the building columns will support the maintenance cranes girders. The centre to centre column spacing at expansion joint will be 1500 mm.

The building foundations will be cast in place reinforced concrete spread/strip footings with perimeter column pedestals connected by a continuous reinforced concrete grade wall. Building interior will consist of independent equipment foundations and slab-on-grade sloping toward drainage sumps to collect spillage. Interior footings for various structures are also included.

Utility piping such as process water, compressed air, gland water, and potable water will run around the inside perimeter of the building, along the underside of the operating floor. These services will be arranged in a loop with all subheaders connected to them.

The building will enclose the following main facilities:

18.4.2.5.1 Grinding Area

The grinding area is a combination of screening, milling, and classification. Plant site dry facilities and office areas are also included.

The main building frames in the lateral (west/east) direction will comprise four column lines supporting roof trusses or beams, crane girders, and intermediate floor girders. Screens, ball mills and cyclones will be located in separate sections, each with their dedicated overhead cranes travelling along a north/south axis. Separate lay down areas for removal of equipment requiring extensive service and delivery of items such as mill liners will be provided for each bay.

Ball mill grinding media (balls) will be stored in reinforced concrete bunkers outside of the building and equipped with ball loading systems in reinforced concrete pits inside the south perimeter of building.

18.4.2.5.2 Screening bay

The screening area consists of an HPGR screen feed bin (outside of the process plant building) that feeds two HPGR screens. The overflow of the HPGR screens recycles the oversize product back to the HPGR feed conveyor feeding the tertiary crushing building. The HPGR screen underflow feed the two cyclone feed pumpboxes each consisting of a set of cyclone feed pumps (one operating and one standby). Also included in the screening area is the HPGR feed bin overhead crane, and the HPGR screen oversize transfer belt magnet.

The HPGR screen feed bin will be a rectangular welded carbon steel plate construction, stiffened with steel rolled sections, supported on structural steel frames. HPGR screens will be supported on steel beams on top of reinforced concrete cyclone feed pump boxes. Oversize chutes and conveyor will be supported by structural steel platforms with operating and maintenance access. Cyclone feed pumps will be founded in pairs on common reinforced concrete pads.

18.4.2.5.3 Grinding Bay

This area consists of two ball mills that are both charged with balls from the media storage bunker, ball mill high lift conveyor, and the ball transfer conveyor. Collector (reagent) is also added to the feed along with underflow of the two cyclopacs. The grinding bay also has an overhead crane, ball mill liner handler, inching hydraulic power pack, two ball mill inching drives, two ball mill lube units and a two-ball mill feed chute transporters.

The ball mills will be founded as a pair on a common reinforced concrete mat foundation on local rock excavation. The mill mat foundation is separated from the building shell foundations and any loose or incompetent bedrock will be excavated and backfilled with lean mix concrete to minimize potential vibration transmission. The ball mills will be supported on large reinforced concrete piers extending from the mat foundations.

The grinding area operating floor will support the heavy operational live loads as well as allow for local storage of stacked liners and the operation of the liner handling equipment. For the elevated steel platform at mill operating floor elevation, reinforced concrete slab on steel decking with embedded railing will facilitate operation of the mill feed chutes at the feed end of the mills. The flooring in the other part of the floor will be steel grating. Openings in the floor will provide crane access to equipment below.

18.4.2.5.4 Cyclone Classification

Each of the two cyclone clusters (cyclopacs) are fed by one of the cyclone feed pumps (one operating and one on standby). The overflow of these two cyclopacs, feeds the two trains of the rougher flotation circuits, while the underflow returns to the ball mill feed.

The cyclone clusters will be supported on elevated steel platforms with reinforced concrete slab on steel decking for spillage containment.

18.4.2.5.5 Flotation Area

Flotation area consists of two trains of 300 m^3 rougher/scavengers cells (two rougher and four scavengers); one train of cleaner/scavengers (three cleaners and six cleaner scavengers); one train of third cleaners, plus one train of second cleaners.

The main building frames in the lateral (north/south) direction will comprise three column lines supporting roof trusses. Crane girders for each line will be supported by stepped columns supporting the overhead cranes travelling along east/west axis.

The flotation cells will be supported on top of elevated steel grillage founded on strip foundations. Various equipment, tanks, pump boxes and pumps will be located on concrete pads or thickened slabs for smaller equipment. Steel access and operation platforms will span over the cells. Multilevel pipe racks will be provided around building.

18.4.2.5.6 Rougher/Cleaner Flotation Cells

The two trains of rougher/scavenger cells are fed by the overflow of the two cyclopacs. with the addition of the test reagent, collector, frother and promotor, the overflow concentrate is collected and directed either to the rougher concentrate pumpbox which feeds the second cleaner flotation circuit, or into the rougher scavenger concentrate pumpbox that pumps the concentrate to the primary regrind cyclone feed pumpbox. The tailings from both rougher scavengers are directed to the tailings pumpbox.

18.4.2.5.7 Cleaner Scavenger Cells

The cleaner scavenger flotation circuit consists of one row of three cleaner flotation cells and six (6) cleaner scavenger flotation cells. The feed consists of primary cyclone regrind overflow, second cleaner flotation tails, and the addition of lime, test reagent, collector, frother, and gravity tails. The cleaner concentrate is collected and directed to the first cleaner concentrate pumpbox and pumped to the second regrind cyclone while the tailings discharge feeds the cleaner scavenger circuit.

With the addition of test reagent, collector, frother, and lime, the concentrate is collected and directed to the cleaner scavenger concentrate pumpbox. Then the product is pumped to the first cleaner concentrate pumpbox.

The cleaner scavenger tailings is directed by gravity to the cleaner scavenger tailings pumpbox and pumped to the final tailings pumpbox.

18.4.2.5.8 Primary & Secondary Regrind Mills & Cyclones

The primary regrind circuit consists of one primary regrind mill (vertimil), one primary regrind cyclone, one primary regrind cyclone feed pumpbox with two primary regrind cyclone feed pumps (one operating and one on standby), and one gravity concentrator.

Feed to the primary regrind cyclone feed pumpbox consists of concentrate from the rougher scavenger circuit, and recycle from the primary regrind mill. Product is pumped to the primary regrind cyclone and is separated into overflow that discharges to the first cleaner flotation cells, with the underflow feeding either the primary regrind mill or gravity concentrator.

The secondary regrind circuit is a supplier package consisting of one secondary regrind Isacharger tank and pump, one secondary regrind media hopper, one secondary regrind media injector, one secondary regrind media dewatering screen, one secondary regrind feed trash screen, one secondary regrind feed pumpbox with two secondary regrind feed pumps (one operating and one on standby), one secondary regrind mill, and a secondary regrind discharge pumpbox with two second cleaner feed pumps (one operating and one on standby).

18.4.2.5.9 Concentrate Thickener

The concentrate thickener consists of one concentrator thickener deaerator tank, and one concentrate thickener. The concentrate thickener is fed by a combination of gravity concentrate, third cleaner concentrate, second cleaner concentrate, lime and flocculant. The underflow is pumped by the concentrate thickener underflow pumps to the concentrate filter feed tank, and the overflow runs by gravity to the concentrate thickener overflow standpipe.

Concentrate area: this circuit consists of one deaerator tank and thickener, two concentrate thickener underflow pumps (one operating and one on standby), one concentrate thickener overflow standpipe, two concentrate thickener overflow pumps (one operating and one on standby), one concentrate thickener filter feed tank with two concentrate filter feed pumps (one operating and one on standby).

18.4.2.5.10 Concentrate Filtration and Storage

This circuit consist of one concentrate filter press fed by the concentrate filter feed pumps, one air/water filtrate separator that separates the air and filtrate, one filtrate tank that pumps the filtrate to the dearator tank by one of two filtrate pumps (one operating and one on standby), and one cloth wash tank and pump. the concentrate discharges to the concentrate stockpile feed conveyor and is transferred to one of two stockpiles by use of the concentrate stockpile feed conveyor diverter chute and transfer concentrate to stockpile 1 or to stockpile 2 via the concentrator stockpile 2 feed conveyor.

Concentrate storage: there are two concentrate stockpiles for blending and loading concentrate haul trucks with a front-end loader. Any dust generated by this process is removed by the concentrate area dust collector and fan.

The concentrator filter press will be supported on elevated steel platforms with reinforced concrete slab on steel decking for containment. The concentrator feed conveyors and diversion chutes will be supported by steel platforms suspended from the roof trusses.

The slab-on-grade in the concentrate stockpile area will support the stockpile as well as wheel loads from a front-end loader and concentrate trucks. Reinforced concrete retaining walls are provided where needed around the stockpile and a wheel wash facility is incorporated in the design.

18.4.2.5.11 Truck Loadout Bay c/w Wheel Wash

The loadout bay will incorporate a truck wheel tire wash package to eliminate contamination and reclaim any concentrate by a sump pump which will recycle the concentrate back to the tailings thickener deaerator tank.

Grinding, flotation and regrind areas will have heating and ventilation systems including unit heaters. Fire protection system will include standpipe hose system, sprinkler system for lube rooms and conveyors and portable fire extinguishers. Dust control system will be provided for cone crusher screening and concentrate stockpile and loadout areas.

18.4.2.5.12 Six Story Multipurpose Building

Maintenance area will be located on the ground floor level. The next level will be dedicated to cable trays entering from electrical room to the process building. Next, there are two levels of offices with meeting rooms and lunchroom. One will be located in third floor above the cable tray area and the other above the plant dry area on fifth floor. The main access to this building will be provided through a stair tower located outside at northwest corner of process building which will be connected to the third level through an elevated walkway. Lunchroom, sized for 24 persons having lunch at the same time also may be used as a large meeting or gathering area. There will be 10 open office workstation and a meeting room for 10 people on each office level floor. There are only two private offices. Fourth floor will provide 132 lockers and 7 showers for male and 33 lockers and 2 showers for female. Facility is designed to provide one double tier locker for each personnel and minimum 1 shower for every 7 persons leaving work at one shift. The ratio of male to female has been assumed as 80% male to 20% female. Washrooms for whole building are located at this level. Central control room is located in sixth floor, with dedicated meeting room and washroom. The building will be separated from process area with one-hour fire-rated wall. Second means of egress will be provided through a stair tower located at east end of multistory building. There is no elevator provided for this multi-level building. A heating, ventilation and air conditioning system is provided for dry areas, central control room and office areas floors. Fire protection system includes sprinkler system and portable fire extinguishers for dry and office areas and fire suppression system for control room.

Offices and meeting rooms will be supported on elevated steel platforms with reinforced concrete slab on steel decking. Interior walls will be composed of metal studs with fire rated panels.

In addition, the process building will include structures annexed on the perimeter of the main frames for the following facilities:

- Tailing Thickening & Pumping – This circuit consists one tailings pumpbox, two tailings thickener feed pumps that charge the tailings thickener feed tank. This tank runs by gravity to the centre well of the tailing thickener. The tailing thickener underflow feed the two trains of three stage pumps that discharge to the tailings storage facility. The overflow from the tailings thickener feeds the tailings thickener overflow standpipe. The overflow (reclaim water) is pumped from the tailing thickener overflow standpipe to ball mills 1 and 2.

- Lime Plant, Test Reagent & MBC Annex

18.4.3 Auxiliary Infrastructure

18.4.3.1 Gatehouse

The gatehouse will be modular wood frame construction. The building is approximately 12 m x 11 m.

The gatehouse will house security officers and have a waiting room with a capacity of 50 persons. This room can also be used for training and safety orientation meetings. The building is designed to be accessible for people with disabilities. No potable water will be available. A refillable water dispenser will be provided for drinking. Signage will be posted at the facility sink that faucet water is not for consumption. Fresh water will be supplied to the building with a tank. And swage will be collected in a portable septic tank under the module. A heating, ventilation and air conditioning system is provided for gatehouse and for fire protection, portable fire extinguishers.

18.4.3.2 Administration Building

The administration building will be a single-story structure, which will house the administrative, engineering, environmental, safety and geology staff. It provides for 61 open space office workstation and 15 private offices, 3 meeting rooms, a lunch room/meeting room with 30-person capacity, and dedicated locker and showers. Environmental lab and the lab staff are also located in this building. Emergency vehicle garage and the first aid facility are attached to the admin building. The garage is sized to provide covered parking space for one ambulance, one fire truck and one mine rescue vehicle. There are two first aid offices and two beds and a dedicated washroom and bath in the first aid area. The whole building will be designed to be accessible for people with disabilities. This building and the main gatehouse will be the only two buildings in the plant which can admit people with disabilities. It is planned to construct the admin area of the building as modular units, and make the first aid and garage as pre-engineered building. Foundations will be conventional spread footings with a perimeter grade wall. A ground floor slab will be provided throughout.

Heating, ventilation and air conditioning systems will be provided for the administration building including fume hood and exhaust system for the environmental lab. Fire protection system includes sprinkler system and portable fire extinguishers.

18.4.3.3 Assay Laboratory

The assay laboratory will be a single-story modular structure complete with insulated floor, walls and roof. The module will be arranged as an annex to the main process building. Foundations will consist of independent spread footings with concrete piers.

Dust control, fume control and heating, ventilation and air-conditioning system are provided for the assay laboratory. Fire protection system includes wet sprinkler system and portable fire extinguishers.

18.4.3.4 Reagent Storage

Reagent storage is approximately 50 m L x 14 m W x 5 m H. The Building is a heated pre-engineered building with 15% slope metal roof panel over exposed laminated blanket insulation. The exterior walls are metal panels over exposed laminated blanket insulation, protected inside up to a height of man doors with a liner metal panel. Storage area is equipped with a loading dock, dock leveler and a dock seal to facilitate winter offloading.

18.4.3.5 Storage Building

The storage building will be a light, un-insulated fire retardant fabric structure supported on spread footings complete with an industrial slab-on-grade. The building size will be approximately 50 m x 25 m x 6 m. There is no heating provided for this building, only ventilation. The large enough roll up doors will be provided on both ends of this building to allow for large size forklift/loader access into the building.

18.4.3.6 Truckshop/Warehouse

The truckshop/warehouse building is part of a complex located in area contains haul trucks and light vehicle maintenance facilities. The building is sized to accommodate four 300 tonne haul trucks based on a ratio of one repair bay for each six trucks. The width of the heavy equipment bays is designed to provide sufficient clear space between haul trucks parked in adjacent bays to permit manoeuvring service equipment. Support vehicle shop will be located with the same length but smaller depth on the opposite side. A warehouse with the size of 50 m x 40 m is attached to the west side of the truck repair bays. Warehouse will be equipped with loading dock, dock leveler and doc seal for winter loading and offloading. There will be lube container storage with pallet racking in south side of warehouse. It will be separated from warehouse with a fire rated wall.

A 5 m wide corridor separates heavy haul truck bays from light vehicle repair area and accommodates pedestrian and forklift traffic from the warehouse. The lube tank and pumping room for approximately eight tanks are located on northeast corner of the truckshop building and separated from other buildings with two-hour fire-rated wall. An outside area paved with concrete slab is located on the east side of truck bays. Tire storage area is also located outside and in the truckshop vicinity. The Mine Dry facility is located in North West side of building and attached to the warehouse. Mine dry is designed to accommodate 304 double tier lockers for male and 76 double tier lockers for female. There are 14 showers for male and 4 showers for female. Facility is designed to provide one double tier locker for each person and minimum 1 shower stall for every 7 persons leaving work at one shift. The ratio of male to female has been based on 80% male to 20% female. Offices for mine operation staff and lunch room/ meeting room with 56 person capacity is located on second floor above the mine dry. The truckshop building will be an insulated and heated steel frame structure. The roof will be 2% slope standing seam metal roof panel over exposed laminated insulation. The exterior wall will be metal wall panels over exposed laminated insulation. Insulation on the interior walls will be protected with a liner metal panel up to the height of man doors. Partition walls between, truckshop, warehouse and mine dry will be fire rated.

Heating, ventilation and air conditioning systems are provided for dry and office areas. Separate heating and ventilation system comprising exhaust fans, carbon monoxide exhaust system is provided for haul truck and light vehicles service bays, lubricant storage and lube tank and pumping areas. Fire protection system includes sprinkler system for truckshop complex and portable fire extinguishers.

Foundations have also been included for the following additional facilities in the truckshop area:

- Fresh water/fire protection water combined storage tank
- Fire protection water pumps and pump house
- Potable water tank
- Sewage treatment plant and holding tank
- Truck Wash – This will be an insulated pre-engineered building with the space to wash one heavy haul truck in a controlled environment. This building will have 15% slope roofs and is the only building made of composite insulated wall panels, due to the wet environment. There will be also a concrete pad outside for light vehicle truck wash.
- Light vehicle fueling station
- Welding area.

Welding facilities are made of four sea containers located in two rows above each other, which are covered by fire retardant fabric structure. The building is fully open on one end to allow rolling of the haul truck body into and out of the building on a track rail.

18.4.3.7 Mine Dispatch

Mine dispatch building is a modular wood frame construction building with approximate size of 8.5 m x 3.7 m. The building is located in the northwest corner of the pit and will control mine traffic. It provides two desks, one washroom and a server room. No potable water will be available. A refillable water dispenser will be provided for drinking. Signage will be posted at the facility sink that faucet water is not for consumption. Fresh water will be supplied to the building with a tank and sewage will be collected in a portable septic tank under the module.

18.4.3.8 Main Substation & Harmonic Filters

The main substation includes the main electrical building (E-House), transformers, various switchyard equipment and incoming lattice structure. The harmonic filter area is located adjacent to the main substation switchyard. The E-house will be a pre-engineered building with insulated walls and roof supported on an elevated concrete floor. The elevated concrete floor will consist of a cast-in-place slab and beam system supported above grade on concrete piers and strip footings. Steel frame stairs and platforms are included in the structural quantities.

Foundations for the main transformers complete with oil containment are included. Concrete quantities for various switchyard equipment and for the incoming lattice structure foundations have been estimated based on comparative analysis with similar facilities. Steel for the lattice structure is included in the electrical scope.

Heating, ventilation/ pressurization and air conditioning is provided for main substation - E House and portable clean agent fire extinguishers for fire protection.

18.4.3.9 Modular Electrical Buildings & Transformers

Remote substations consisting of modular electrical rooms and outdoor transformers are located at various locations across the site. Modular electrical buildings will be supplied complete with insulated floor, walls and roof as well as steel stairs and landings. These modules will be supported above grade on concrete piers and strip footings. Transformer foundations at remote substations will include oil containment where required.

Heating, ventilation/ pressurization and air conditioning are provided for modular electrical rooms and portable clean agent fire extinguishers for fire protection.

18.5 Fresh Water Supply

Fresh water will be used for a variety of purposes including use for drill water, dust suppression, start-up, process water makeup, and fire water. Kamloops Lake will be the fresh water source for the project.

The fresh water supply system will utilize a rebuilt intake using the existing infrastructure from the historic Teck operation (now part of the New Afton mine), which began operation in 1978. The existing infrastructure that will be incorporated into the fresh water supply includes an intake pipe, wet well and 8.1 km of steel pipeline.

The existing pipeline is currently in operation as part of the fresh water supply to the New Afton mine. The existing shared pipeline dictates the pump station configurations and design constraints of the system. The operating and controls philosophy for the shared pipeline is to meter flow in and out of each booster station. Flow metering is essential to ensure each mine pumps their required water and has an operationally independent system.

The proposed fresh water supply system includes an intake pump station (incorporating existing wet well and intake pipe), two booster pump stations and 24 km of buried steel and high density polyethylene pipe (includes 8.1 km of existing line noted above). The mine water balance requires a fresh water supply of 1,300 m^3/h. The fresh water supply system is designed to supply 1,500 m^3/h to the Ajax mine site. Vertical turbine pumps were selected for the high head to flow capacity ratio, and small footprint. The fresh water supply system will work in conjunction with the New Afton fresh water system that supplies 300 m^3/h to the New Afton mine site for a combined pipeline flow of 1,800 m^3/h. The pipeline is capable of carrying more water should one or both of the mines need to increase supply. The following is a summary of the fresh water supply system components.

18.5.1 Fresh Water Intake

The Intake Booster Station will be constructed using parts of the historic Teck (now part of the New Afton mine) intake. The building superstructure, intake screen and a portion of the intake pipe will be demolished and removed from site. The Ajax fresh water booster station will make use of the existing historic Teck wet well and a portion of the intake pipe. The Ajax Intake will tie into an existing New Afton 400 mm plug valve. The upstream side of the existing plug valve is connected to the New Afton fresh water supply.

The intake will consist of two new wire mesh, stainless steel intake screens installed on concrete support pads at the lake bottom (325 m elevation). The design low water level is based on the 200-year low water level. Intake piping will consist of 850 mm diameter high-density polyethylene pipe slip-lined through the existing 900 mm corrugated steel intake pipe and 600-700 mm diameter epoxy coated schedule 40 steel.

The design Kamloops Lake low water level is below the water elevation required to start the pumps. A vacuum priming system will be installed to raise the water level in the pump columns in the event that the station needs to be started during low water levels.

The Intake will be constructed above the historic Teck wet well. The building will be two storeys with a 100 m^2 footprint. The station consists of 4,700 HP vertical turbine pumps (3 duty and 1 standby) with variable frequency drives directly piped to the intake screens and installed in a dry well. The duty point for each vertical turbine pump is 500 m^3/h at 270 m TDH. The building will be constructed with a mezzanine (347.6 m elevation) above the 200-year flood level (346.8 m) to protect electrical equipment. Flow metering located at the station outlet will be used to monitor the station flow, with the flow controlled via the variable frequency drives. A 10 m^3 hydropneumatic surge tank, air control valves and a pressure relief valve will be used to mitigate pressure surges from water hammer. Station piping is 300-450 mm diameter epoxy coated schedule 40 steel pipe. The station will be equipped with a crane, a bay door and roof hatches to remove equipment.

18.5.2 Fresh Water Booster Station No. 1

Fresh Water Booster Station No. 1 will be a new building constructed adjacent to the existing New Afton booster station. The building will have a 100 m^2 footprint. The floor elevation will be 573.0 m elevation. The station will consist of 4,700 HP vertical turbine pumps (3 duty and 1 standby) with variable frequency drives installed in a wet well. The duty point for each vertical turbine pump is 500 m^3/h at 270 m TDH. The wet well active storage volume is 175 m^3 (Low water elevation at 568.7 m elevation and high water elevation at 571.7 m elevation). Flow in and out of the station will be metered. Inflow to the station will be controlled with a 350 mm v-port ball valve with electric actuator, and flow out of the station will be controlled via the variable frequency drives. A 10 m^3 hydropneumatic surge tank, air control valves and a pressure relief valve will be used to mitigate pressure surges from water hammer. Station piping is 300-450 mm diameter epoxy coated schedule 40 steel. The station will be equipped with a crane, a bay door and roof hatches to remove equipment.

18.5.3 Existing Pipeline

The existing 8.1 km of steel pipeline is 24” diameter, schedule 10, yellow-jacked steel. An investigation has been performed to confirm the integrity of the piping. Considerations have been made to address the risk of using the existing, 37 year old pipeline.

18.5.4 Booster Station No. 2

The station will consist of 4,800 HP vertical turbine pumps (three duty and one standby) with variable frequency drives installed in a wet well. The duty point for each vertical turbine pump is 500 m^3/h at 335 m TDH.

18.5.5 Proposed Pipeline

Piping from the Booster Station No. 2 to the fresh water tank at the plant site will be based on the pumping rate of 1,500 m/h at 335 m TDH. The fresh water pipes will be 24” diameter carbon steel (CS) and 30” HDPE DR9, in the length of 7,600 m and 8,800 m respectively. The pipeline will be buried in the 2 m deep trench running along the plant site main access road.

The fresh water system will include 20 air/vacuum valves to prevent air pockets at the system start-up and vacuum condition in the pipeline. The air/vacuum valves will be installed at each 800 m of the pipeline as per requirements of AWWA (American Water Works Association).

The fresh water line will be placed in the common trench with the Peterson Creek Diversion pipeline in the total length of 6.3 km.

Fresh water supply to the truckshop and primary crusher areas will be via pipe feeds (4” and 10” pipes) connected to the main fresh water line. Both lines will be buried along the road and equipped with the pressure control valves located upstream from the tanks to regulate pressure as per water demands at the truckshop and primary crusher.

18.6 Power Supply & Distribution

18.6.1 230 kV Utility Power Supply & 230 kV Main Substation

BC Hydro (BCH) completed a System Impact Study in 2010 and a Facility Study in 2012 for Ajax Mine Load Interconnection project. BCH studies were completed considering total plant load of 73 MW and ultimately reaching 99 MW.

During the updated engineering phase, Fluor captured all the major process and mining loads changes. The total plant peak load will be approximately 112 MW.

During update engineering phase, (BCH) British Columbia Hydro’s study group was unable to confirm the 230 kV interconnection location will stay the same as the previous feasibility stage. As per agreement with KAM, it was decided for purpose of this report, the BCH interconnection location to be considered the same as feasibility study phase (Jacko Lake Substation). A new BCH system impact study is underway to confirm the Ajax interconnection point is still at 230 kV Jacko Lake Substation.

Power to the plant site shall be supplied by a 230 kV single circuit overhead line from the new BCH substation (Jacko Lake) located approximately 12 km from the mine site. The pole line shall be terminated at an incoming structure in the mine site main 230 kV substation. The 230 kV voltage shall be transformed to 25 kV using two 230 - 25 kV transformers. Each transformer shall feed a 25 kV GIS switchgear in which they shall be tied together using a tie circuit breaker. The transformers are sized to permit full operation of the plant on only one transformer in service with the second out of operation because of failure or maintenance.

18.6.2 Site Power Distribution

18.6.2.1 25 kV

Overhead powerlines shall supply 25 kV power to the mine pit, primary crusher and coarse ore stockpile, fresh water system, truckshop and tailings system equipment and infrastructure.

Power at 25 kV power will be delivered to all distribution transformers in the plant via 25 kV cables on above ground cable trays where possible, or through underground duct banks when crossing roads.

18.6.2.2 4.16 kV

In the process plant area secondary selective 4.16 kV motor control centres shall deliver power to large process motors, HPGRs, and to large process-adjustable speed drives for various process and tailings pumps.

18.6.2.3 600 V

Power will be delivered to the plant low voltage motors and building services loads via 600 V motor control centres.

18.6.2.4 Backup Power

Five single 2.1 MW, 4160 V standby rated natural gas/diesel generator sets complete with 4160 V switchgear, zigzag transformer and NGR are provided at the main substation to provide backup power to the plant critical loads.

18.7 Fuel Supply, Storage & Distribution

18.7.1 Fuel Supply

Diesel will fuel all mine and plant mobile equipment. Diesel fuel will be unloaded from tanker trucks at the heavy vehicle fuelling station adjacent to the primary crusher and the light vehicle fuelling station adjacent to the truckshop (separation created using heavy vehicle berms).

Gasoline will be used by KAM light vehicles such as pickup trucks, select portable tools and some maintenance equipment. Gasoline will be unloaded from tanker trucks at the light vehicle fuelling station located adjacent to the truckshop.

18.7.2 Fuel Storage

The heavy and light vehicle fueling stations will have five horizontal tanks (100,000 litres each to store diesel fuel) and three horizontal tanks (1 x 13,638 litres for clear gasoline, 1 x 13,638 litres for dyed/marked gasoline, and 1 x 50,000 litres for dyed/marked diesel), respectively for distribution. Each haul truck fuel storage tank will be approximately 3.2 m diameter by 12.2 m long carbon steel horizontal tank.

Tanks will be supported on compacted gravel pads with perimeter reinforced concrete walls to contain gravel and will include a containment area.

Fire protection for the area will be supplied by a foam-water type system injecting foam directly into the top of each storage tank. The foam system will comprise fire water piping, a foam storage tank along with two pumps.

18.7.3 Fuel Distribution

Haul truck fuel module will store and handle diesel fuel with capability to simultaneously refuel two haul trucks at the same time. The fuel delivery trucks will access the fuel storage depot from a dedicated access road and circle counter-clockwise around the berm to enter the fuel loading station from the east while haul trucks will be refilled at the doghouse. The light vehicle fueling area will be located near the truck shop and will provide diesel and gasoline fuels to the plant mobile equipment.

The tanks will sit in an area enclosed by a berm and lined with HDPE to fully contain any fuel spillage. The fuel area will be protected with foam and portable fire suppression equipment.

Lighting will be provided to illuminate the dispensing stations and for all access walkways and stairways.

18.8 Site Security

18.8.1 Purpose

The purpose of site security is to protect all project personnel, company and personal property, and other assets from injury, harm, and damage from criminal, hostile, or malicious act by implementing appropriate and suitable security provisions to manage identifiable project security needs.

KAM will be responsible to provide appropriate and suitably trained security personnel, facilities, and equipment to support project requirements for physical and general site security.

KAM will be responsible to ensure that physical and data security is in place for the worksite offices in its control. Should there be a requirement to increase the level of security; the Ajax Project will determine the type and new level of security required.

Service providers and their subcontractors will be responsible for the physical security of their offices, lunchrooms, tools, and equipment, and material at the worksite.

The security provisions for the project will be identified and documented in the project Security Plan. In this case, KAM team members and the contractors should follow the Security Plan established.

18.8.2 Security Standard

The objectives of KAM's security standard are to contribute to:

- Creating a secure business environment
- Safeguarding people, property, information and reputation
- Minimizing economic losses and business disruption.

The following standard outlines the minimum requirements for the management of security at the Ajax Project:

- Operations will be conducted in full compliance with Ajax's Statement of General Business Principles and Code of Ethics.
- Security risks will be assessed as circumstances dictate, and at a minimum by each major operations team at least once per year.
- Security measures proportionate to the assessed risks will be in place. They will apply to all business assets, including people, property, information and reputation.

- Work practices and procedures will be in place to deal with security incidents and emergencies.
- Security incidents will be reported through Ajax's Site Incident Reporting System (SIRS), and will be investigated.
- Security awareness information will be provided to all team members and contractors as part of the orientation sessions. Detailed security related awareness programs are available through the Security Operations Team.

18.9 Communications

Proven, reliable and state-of-the-art communications systems will be installed to ensure that personnel at the plant and mine site have adequate voice, data and other communication channels. The communication systems will include a voice over IP (VoIP) telephone system over a plant-wide fibre optic network.

The fiber optic infrastructure within the plant will be shared between the plant Process Control System (PCS) and the IT & Communications systems. OPGW cables (either 48 or 96 fibres) will be used for the backbone communication links along the overhead powerlines to the outlying areas (including Tailings Storage Facility, fresh water and remote pump stations).

Hand-held mobile and base radios will be used by operating and maintenance personnel. The radio system will include a communications tower and base station.

Cellular phone coverage will be sourced via the local cellular provider.

Internet connectivity and external telephone service to the plant will be sourced via a local telephone company or internet service provider. The connection to the internet service provider will be made via an OPGW fibre link.

19 Market Studies and Contracts

The Ajax project will produce a flotation sulphide copper concentrate with a significant gold credit. The concentrates are expected to be trucked from the site to a port in Vancouver for shipment to copper smelters in Asia.

19.1 Macroeconomics Conditions

Most economies have seen a shift in gross domestic product (GDP) growth to a noticeably lower path compared to pre-2007-08 crisis levels, raising the spectre of longer-term mediocre economic growth. In the developed economies, although some improvements are observed, significant downside risks persist, especially in the Euro area and Japan. Growth rates in developing countries and economies in transition have become more divergent , with a sharp deceleration in a number of large emerging economies, particularly in Latin America and the Commonwealth of Independent States (CIS).

In a weak economic environment, commodity consumption has been challenged globally, offsetting any demand boosts from lower prices. Commodity demand is not just tied directly to the underlying elements of GDP growth, but especially to emerging market economic growth, where commodity-intensive fixed asset investment and industrial production growth are stronger than in advanced economies.

The recent sell-off on commodities has been driven to a large extent by the US dollar strengthening against other currencies. Major currency trends typically last several years, which implies that dollar strengthening will continue. Lower prices for energy and other supplies have led to lower input costs, driving down the cost curves mine production.

Demand growth has been structurally and cyclically challenged and producers have also not fully adjusted to China's key industrialization period drawing to a close. Focusing on supply, miners have started working hard to cut production costs, which may help individual companies, but makes the competitive environment even harsher.

19.2 Market Outlook

19.2.1 Copper Metal

19.2.1.1 Copper Demand

Global demand for refined copper is forecast to increase to over 30 Mt in 2035 from the current 22 Mt. This amounts to a compound annual growth rate of 1.6% annually between 2015 and 2035. At the regional level, there is positive sentiment about consumption in the mature economies of Western Europe and North America. Consumption is also expected to grow at strong rates in India and Southwest Asia, whereas China's growth rates are slowing down faster than previously expected. Chinese copper consumption is expected to grow at a range of 3-4% annually over the next five years. By 2025, China, with around 14 Mt of copper consumption, is expected to account for half of global copper demand.

The most important sectors for copper consumption are construction and infrastructure, accounting for an estimated 54% of demand in 2015, but expected to fall to 51% by 2020.

Power grid investment has been lower than expected largely due to the anti-corruption checks in China's two major grid companies, State Grid and China Southern Power Grid.

Substitution of copper for lower cost materials remains a considerable long-term challenge to refined copper consumption, given the price of copper relative to its close substitutes. The substitution threat has grown in automotive harnesses and low voltage power cable, while the threat facing air conditioning units and data cable remains roughly the same.

19.2.1.2 Copper Supply

There is wide consensus on the market that over the short to medium term, the copper market will remain in surplus, with the pace of supply growth set to outstrip that of demand, and push surpluses to a peak in 2017. This will inevitably strengthen a downward pressure on copper prices. Thereafter, as the pace of supply growth slows relative to demand and as accumulated inventories are drawn down and consumed, prices are expected to trade higher.

Global mine production continued to grow during 2014 reaching 18.7 Mt, 3.2% higher than the total achieved during 2013. This increase compares with an 8.0% rise seen in 2013 and a compound annual average growth rate (CAGR) of just 1.8% over the period 2002 to 2012. Strong growth is forecast to continue in 2015 and 2016 with production capability exceeding 20 Mt for the first time.

Additions to mine capacity during the period 2014 through to 2018 represent a CAGR of 3.4%. However, recent announced production cuts at copper mines in reaction to low copper prices may reduce production in 2015-2017 and help improve prices from their current levels.

Beyond 2018, copper mine production growth is expected to decline due to reserve depletion at current operations and a lack of capital investment in projects over the next few years. This should result in a deficit on the copper market in the medium- to long-term period.

19.2.2 Gold Metal

After a sharp fall in 2013, global gold supply (mine and recycle production) in 2014 stabilized approximately the same level as the year before - 3,908 tonnes, or only 0.2% less than in 2013. Mine production climbed by 2.2% to a record high of 2,971 tonnes last year, marking six years of uninterrupted growth. The volume of gold recovered from recycled materials fell by 13% year-on-year, to 1,125 tonnes.

The average gold price fell by ca. 10% in 2014. Unlike in 2013, lower prices failed to stimulate fabrication demand in 2014, while global gold supply remained largely unchanged. The official sector continued to lend support to the gold market in 2014, absorbing a net 278 tonnes of gold, a significant 22% year-on-year increase in central banks' buying activity. In jewellery and coins segments the annual consumption collapsed by 10% and 37% respectively. The chief driver of last year's fall in jewellery fabrication was a decline in demand from the Chinese consumers as they destocked after buying in 2013. The demand for gold from key industrial applications, notably electronics and dentistry, continued on a downward trend in 2014.

The gold market surplus is forecast to decline in future as production slows down. In longer term, fundamental gold demand drivers, apart from awaited rise of investment demand, should be jewelry demand from India and China.

19.2.3 Copper Concentrates

Copper concentrates are sold by mines to smelting companies and merchants; therefore, the market for this intermediary product has supply and demand factors somewhat independent of the overall copper metal market balance. The price of the concentrates is determined by the value of the copper and precious metals contained less the treatment and refining charges (TC/RCs) that are deducted against the value of the payable metal. Approximately 42% of the global copper concentrate production originates from integrated facilities, which consist of those mines that have their own smelters and refineries, such as Chuquicamata in Chile and Kennecott in the United States. The balance of concentrate production is sold to “custom” smelters that buy copper concentrates and process them to produce copper blister and anodes and further refine the copper to cathode. Smelters typically hedge their concentrate purchases against their forward blister/cathode sales and thus have limited exposure to fluctuations in the copper metal price.

Several factors shape the copper concentrate market. The most important ones are the growth of the primary smelter capacity and the mine supply. Annual TC/RCs, often referred to as “benchmark terms), for 2015 reached an all-time high level of $107/dmt and 10.7¢ per payable pound contained. Benchmark terms in 2016 are expected to be lower based on the current supply & demand forecast for concentrates in 2015 and 2016. It is believed that the primary smelter capacity will keep pace with new mine supply over period 2015 to 2018. Afterwards, the falling head grades and reserve depletion will result in lower output from current mines and a requirement for companies to invest in new projects. However, the 3-5 year period to construct major copper mines is expected to result in a supply gap for both copper concentrates and copper metal in general. Consequently, long-term TC/RCs are expected to decline from current levels. In addition, many countries are putting restrictions on the export of raw materials, including copper concentrate. Zambia, D.R. Congo and Indonesia, all of which are major copper producing nations, have already, or are in the process of, implementing bans or taxes on the export of copper concentrates. This will result in continued investment in copper smelters in those countries, even though the economics for constructing new smelting capacity is not warranted at global market conditions.

The quality of concentrate is another factor affecting the market. Currently due to the higher production of copper concentrates containing different impurities (arsenic, among others), clean concentrates are in high demand and this trend is expected to continue into the near future. Since many of the new mines that will be brought on-stream beyond the current 3-5 year horizon are those that are not economic at current conditions, often due to such deleterious elements, it is expected that more concentrate will be produced that contains high levels of impurities. Therefore, clean concentrates and those with only slightly elevated levels of impurities will remain in strong demand.

19.3 Price Deck

KAM’s view on the commodity market in the short, medium and long term is reflected in its Price Deck that is produced at least annually. The Price Deck (Table 19-1) contains KAM’s forecast prices for all metals as well as TC/RCs and these numbers will be used for the economic modelling of the project.

Table 19-1: Price Deck

	Unit	2016	2017	2018	2019	2020	2021	2022	2023	2024	Long Term
Copper	$/lb	2.54	2.90	3.18	3.40	3.40	3.36	3.32	3.29	3.25	3.21
Silver	$/oz	14.00	14.00	15.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
Gold	$/oz	1,100	1,100	1,100	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Concentrate TC/RC	$/dmt	100	100	95	90	85	-	-	-	-	85
	US¢/lb	10.0	10.0	9.5	9.0	8.5	-	-	-	-	8.5

19.4 Sales Strategy

The base scenario will be to sell Ajax concentrates to copper smelters in Asia. Logistics costs to destinations in Europe are higher and there is not a sufficient amount of dry-bulk vessel capacity available to move concentrates to other destinations. This is also now the region with the largest consumption of custom copper concentrates and is where the majority of KAM owned Robinson concentrates have historically been sold.

Asian smelters also have a more competitive payable gold formula and it is expected that there will be a significant gold credit in the copper concentrate. Copper smelters in Europe typically demand a minimum deduction of 1 g/dmt, which would reduce the payable gold in Ajax concentrates to below 95% compared to likely >97% in Asia for a quality such as Ajax. Japanese smelters typically have the best gold payable formulas. However, they typically do not take concentrates with >5ppm of mercury, which Ajax concentrates may exceed. China imposes a 100 ppm limit on the mercury content in copper concentrates imported into the country. Ajax concentrates are expected to be well below this level and therefore, this will not be an issue for importing into China based on the current regulations. The remaining deleterious elements are below typical penalty levels for copper concentrates.

While the gold level provides Ajax with a substantial revenue stream, it may restrict the number of smelters that would consider a long-term contract for Ajax concentrates. Only a few Chinese smelters in China are willing to accept concentrates with medium to high levels of gold. This is also due to the fact that the gold content ties up credit lines for letters of credit that Chinese smelters need to issue in order to import concentrates. However, there are a sufficient number of smelters in China and in Korea that would accept Ajax concentrates at competitive terms while providing a sufficient gold payable level. Our strategy will be to approach these smelters first, as they are the best freight destination for Ajax.

As a contingency, we will also maintain a dialogue with smelters in India and the Philippines. NewGold sends its New Afton copper concentrates, which are more complex than Ajax, to smelters in these countries. Teck also supplies these smelters with concentrates from its Highland Valley Copper mine. Both of these concentrates are shipped from the port of Vancouver, BC. As a result, there would be opportunities for combining Ajax concentrate shipments with both NewGold and Teck concentrates to reduce the freight differential of shipping to these smelters versus shipment to China/Korea. Therefore, the base case will be to ship 100% of Ajax concentrate to smelters in China and Korea while maintaining the contingency plan for shipment to more expensive (ocean freight) destinations.

Because the Ajax concentrate will have a limited number of target smelters, the approach will be to secure long-term sales agreements for the vast majority of its annual production. We will target approximately 85%-90% of the annual capacity to be placed under long-term (minimum 5 years with an "Evergreen" clause) contract. Most of this volume will be sold directly to smelters. However, we will also consider the option to have a portion of the long-term sales agreements with top copper concentrate trading companies. The remaining position (10%-15% annually) will be sold as spot tonnage to trading companies.

19.5 Sales Terms

Estimated sales terms have been provided to the Ajax project for economic modelling. These assumptions are based on the typical terms for copper concentrates sold in the current market. KAM has a long history of selling concentrates, including Robinson, Sierra Gorda and from its mines in Poland. The typical terms are therefore well known to the company.

The following are the contractual terms that Ajax can expect to receive for its copper concentrates. Treatment and refining costs are not included here (please see above section on TC/RCs):

- Cu Payable: -1 unit (i.e., for 25% concentrate, take off 1 unit so 24% is the payable level, thus 96% of the content)
- Au Payable: for 10-15 g/dmt, 96.5%; for >15 g/dmt 97%; Refining charge of $5/oz
- Ag payable: 0% of <30 g/dmt; 90% if >30 g/dmt; Refining charge of $0.40/oz
- Treatment and refining costs: please see above section on TC/RCs
- No Price Participation
- Mercury: Penalty of $0.15/dmt for each 1ppm above 20ppm/dmt in the concentrate
- Payment terms: For direct smelter contracts, payment via letter of credit "at sight" – assume 15 business days following bill of lading to receive funds. For trader contracts, assume payment 5 business days following bill of lading date.

19.6 Logistics

Ajax copper concentrates will be produced on site near Kamloops, BC. Options for the concentrates to be shipped via rail, by trucking to a nearby rail siding and loading into gondola wagons for transport to the port of Vancouver, BC were evaluated. However, NewGold, which operates the New Afton mine located in close proximity to Ajax, extensively reviewed its transportation options and decided to proceed with shipping its concentrates to Vancouver via truck. While New Afton produces less concentrates than Ajax is expected to generate (currently around 175,000 wmt), it is a strong benchmark for Ajax's transport requirements.

Each truck is able to load 50 wmt of concentrate. Ajax will have to apply for a permit to receive the approval to load this quantity (without the permit, the max load would be ~42 wmt per truck). However, it is expected that there would not be any obstacles to receive the permit. This has to be applied for in advance, but they did not have any issues getting the permit. Trucks typically go via the Coquihalla highway to Vancouver and, with the proper permit, may ship the maximum load of 50 wmt. However, in the event of the closure of this highway, trucks must travel via Highway 1 and in such case; they are limited to 42 wmt per truck.

Trucking rates are estimated below. This estimate is based on indications received from a trucking company as well as benchmarking with other producers in the region. Based on benchmarking with other producers in BC, Ajax would likely need ~8-9 trucks in its fleet which would be provided by the trucking company (estimated costs provided herein are "all-in"). Ajax could likely also pool with other mines in the region if it decides to work with the same trucking company.

Shipping by rail was investigated. However, feedback from other producers as well as the port operator in Vancouver suggested that trucking is the best option for cost, flexibility and timing. There is significant rail congestion in North Vancouver and rail cars are often blocked for several days at a time. This can lead to difficulties in scheduling rail car unloading and meeting ocean shipment deadlines and can result in increased costs for rail car demurrage. In addition, Ajax concentrate would need to be trucked to a rail siding first (for example, in Ashcroft or Kamloops), then loaded into gondola railcars and transported to the port. This would result in an additional transshipment and increased concentrate losses.

KAM Commercial visited the Port of Vancouver and its operator, Vancouver Wharves, and viewed the unloading facility in the New Afton and Copper Mountain warehouse. Trucks enter the warehouse and lock into place at the top of a ramp. The entire platform, including the truck, tips to the right to dump the concentrate. Front-end loaders then move the concentrate across the warehouse to the stockpile. Ajax concentrates would likely go to a different warehouse at the port. However, Vancouver Wharves advised that they could install the same system in the Ajax warehouse, or potentially use the current one and move Ajax concentrates from the New Afton and Copper Mountain facility to its own warehouse. Ajax is already well advanced in their plans and they have two areas where Ajax concentrates could be stored. Vancouver Wharves advised that they would be able to accept either possibility. The estimated port costs are provided below. Any CAPEX would be built into the rate and the rate would like drop after the first 7-10 years when the environmental levy would be eliminated.

Ajax concentrate would most likely be shipped in parcels of 10,000 dmt, as is typical of the industry. This would result in approximately two parcels of concentrate shipped each month from the port. Ocean freight costs are estimated at $50/wmt based on an historical review of concentrate shipping costs from the ports of Vancouver, BC including some contingency due to the volatile nature of this market. A decision to charter partial vessels on the spot market or to enter into a contract of affreightment (COA) would be made much closer to production.

- Trucking costs from site to port: $35 per wmt
- Port costs: $40 per wmt for years 1-7; $32 per wmt thereafter (need to pay an environmental charge for CAPEX in the first years)
- Ocean Freight: $50 per wmt
- Weight losses en route: 0.25%
- Assays/Supervision costs: $2 per dmt.

20 Environmental Studies, Permitting and Social or Community Impact

The Project has been subject to environmental and social studies covering different aspects relevant to the Project, including an environmental assessment under federal and provincial legislation that is currently underway. ERM was retained by KAM to coordinate the preparation of the environmental assessment document (Application/EIS). In doing so, ERM has relied on the information and data provided by KAM and its technical consultants in the preparation of this Section. ERM has assumed this information and data to be complete and accurate and has only provided commentary on the results of the work of others in a manner that is consistent with what is noted in the Application/EIS.

20.1 Permitting

20.1.1 Environmental Assessment Review Process

Major mining projects in BC are subject to environmental assessment as part of the legislated certification and permitting process. The Ajax Project is subject to review under the British Columbia *Environmental Assessment Act* (BC EAA 2002). Federally, the project will be reviewed as a comprehensive study under the former *Canadian Environmental Assessment Act* (CEAA 1992), under the transition provisions of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012).

In general, the provincial and federal EA processes include four main elements:

- Provide opportunities to all interested parties, including Aboriginal groups, to identify issues and provide input
- Technical assessment of the potential environmental effects, and additional social, economic, heritage, and health effects of the proposed project
- Implementation of mitigation measures that avoid, minimize, control, or compensate for adverse effects, and that enhance beneficial outcomes
- Consideration of issues and comments raised by interested parties when evaluating the significance of likely adverse effects, and when making recommendations about whether the project may proceed.

20.1.1.1 Cooperative Environmental Assessment

The EA is conducted under the principles of the now expired bilateral *Canada–British Columbia Agreement for Environmental Assessment Cooperation* (the Agreement; Government of British Columbia and Government of Canada 2004). Under the Agreement, both the Government of Canada and the Government of British Columbia conduct a single, cooperative assessment, where possible, to meet the EA requirements of both levels of government while allowing for independent decision making on matters within their own legislative authority. The Agreement aligns key aspects of the EA process to minimize duplication and improve efficiency (e.g., conducting joint public comment periods, coordinating Aboriginal consultation, using common documents that meet the requirements of both governments, and establishing common working groups to facilitate the review process).

Subject to Section12(1)(2) of the Agreement, where the proposed project is located on lands within provincial boundaries, the Government of British Columbia is the Lead Party for the EA process. Although the Agreement is now expired, both governments continue to coordinate EA processes in keeping with the principles of the Agreement.

The provincial and the federal EA processes move through several steps:

- Determination of whether an EA is required
- Establishing the Working Group that will be involved in the EA review process
- Preparation and planning for the Application/EIS by developing information requirements (e.g., drafting the Application Information Requirements [provincial] or EIS Guidelines document [federal][3])
- Review and analysis of the Application/EIS
- Preparation of the Assessment (provincial) and Comprehensive Study (federal) reports
- Referral to the appropriate provincial and federal ministers for a decision

20.1.1.2 Joint Environmental Assessment Working Group

The BC EAO and the CEA Agency established the EA Working Group and began holding project-related meetings on April 27, 2011. The purpose of the Working Group is to review and comment on key EA documents, including the AIR/EIS Guidelines, the Application/EIS, and the BC EAO and CEA Agency Assessment/CSR.

Typical membership of an EA Working Group includes representatives from all levels of government (federal, provincial, regional, and municipal), potentially affected Aboriginal groups, and other stakeholders as required. The members of the Ajax Project Working Group are identified in Table 20-1.

Table 20-1: Ajax Project Environmental Assessment Working Group Members

Type	Organization
Provincial agencies	BC EAO
	British Columbia Ministry of Forests, Lands and Natural Resource Operations (BC MFLNRO)
	British Columbia Ministry of Energy and Mines (BC MEM)
	British Columbia Ministry of Environment (BC MOE)
	British Columbia Ministry of Transportation and Infrastructure(BC MOTI)
	Interior Health Authority
Federal agencies	CEA Agency
	Department of Fisheries and Oceans Canada (DFO)
	Transport Canada (TC)
	Natural Resources Canada (NRCan)
	Environment Canada (EC)
	Health Canada, BC Region
Local/Regional government	City of Kamloops
	Thompson-Nicola Regional District
Aboriginal Groups	Skeetschestn Indian Band (Stk'emlupsemc of the Secwepemc Nation)
	Tk'emlups Indian Band (Stk'emlupsemc of the Secwepemc Nation)
Working Group First Nations	Ashcroft Indian Band
	Lower Nicola Indian Band

[3] Under a joint EA process, the proponent will submit one document that meets the requirements of both governments, referred hereafter to as the AIR/EIS Guidelines.

20.1.1.3 Provincial Environmental Assessment Process

The provincial EA process is divided into three stages: the Pre-Application stage, the Application Review Stage, and the Decision. KAM initiated a number of pre-EA activities in an effort to prepare for the assessment process. This included conducting field and desk-based technical studies, and developing and implementing consultation and engagement programs with Aboriginal groups and the public.

20.1.1.3.1 Pre-Application Stage

KAM entered the Pre-Application stage of the provincial process with the submission of a Project Description (PD) on December 6, 2010 to the EAO. A revised PD was submitted on February 8, 2011, to address comments from the EAO. After reviewing the revised PD, an Order under Section 10(1)(c) of the BC EAA (2002) was issued by the EAO on February 25, 2011 indicating the Ajax Project was reviewable. The Section 10 Order stated that the project required an EA Certificate and that KAM may not proceed with the project without an assessment.

An initial Working Group meeting was held on April 27, 2011, to present an overview of the project, provincial and federal EA processes, and discuss field studies and preliminary issues. Based on early feedback, Aboriginal and Public concerns, and continuing refinements to the project design, namely engineering and economic issues, KAM submitted a revised version of the Project Description on May 17, 2011. On June 3, 2011 the BC EAO ordered (under section 11 of the EAA) that a first public comment period and open house be conducted in advance of the acceptance of the Proponent's final Project Description[4]. The purpose of this initial 33-day public consultation, from June 8 to July 11, 2011, was to consult the public residing in communities in the vicinity of the project on potential effects of the proposed project. The comments were compiled and addressed in an issues-tracking table; most of the issues related to air quality/dust and land and resource use. A final PD was submitted to the BC EAO on July 6, 2011.

The AIR (formerly referred to as a Terms of Reference) identifies the information required to be submitted in the Application. In line with the federal-provincial coordination process, the provincial AIR document and the federal EIS Guidelines were prepared as one document for the project and are referred to as the AIR/EIS Guidelines. The Proponent prepared a draft AIR (dAIR) for the project, and submitted it to the BC EAO for review on April 18, 2011. The dAIR was then revised to address EAO's preliminary comments and submitted on June 15, 2011. The dAIR was then revised a second time and re-submitted on August 11, 2011 based on feedback received from the first public consultation period, which included adding valued components to the scope of the assessment. A third revision was made to the dAIR on January 6, 2012 to address Working Group comments and the dAIR was posted to the EAO's electronic project Information Centre (e-PIC) website on January 11, 2012 for public comments. A 75-day public comment period on the dAIR/EIS Guidelines ran from January 11 to March 27, 2012. Issues and concerns were tracked and responded to by KAM.

[4] Under Section 7 (1) of the Public Consultation Policy Regulation Public Consultation Policy Regulation, BC Reg. 373/2002., the Proponent must hold a minimum of one formal public comment period of between 30 to 75 days. Common practice is to hold a public comment period on the AIR/EIS Guidelines, and a second one on the Application/EIS; expectations on the timeline and duration of the public comment periods are outlined in the section 11 Order. In this case, the BC EAO deemed it necessary to issue a section 11 Order requiring a first public comment period on the Project Description. A second section 11 Order outlining the scope and procedures of the EA was issued on January 11, 2012.

A final AIR incorporating comments received from the public, Aboriginal groups, Working Group, Community Advisory Group (CAG), federal, provincial and local government agencies was submitted to the BC EAO on June 13, 2013, and posted on the e-PIC website on June 25, 2013.

On November 10, 2014 due to project design changes, a revised AIR was posted to e-PIC to reflect the new Ajax South General Arrangement, which presents the optimized project design intended to address concerns raised in earlier consultation processes. The project design reflected in the revised AIR and used as the basis of the Application/EIS is not, for regulatory purposes, materially different than the Project as described in this Technical Report.

Key changes included moving major components further away from the city of Kamloops and a change in tailings storage technology. These updates were reviewed and modified based on feedback from the Project Working Group. A 30-day consultation period on the revised AIR was held from November 18 to December 18, 2014. A revised and final AIR was posted to e-PIC on July 23, 2015, taking into account issues raised during the consultation period.

On January 11, 2012, the EAO issued a second order pursuant to section 11 of the EAA (2002), which prescribed the scope, procedures, and methods to undertake the provincial EA, including public, government agency, and Aboriginal consultation requirements.

The scope of the project, originally defined in the section 11 Order and updated in the Section 13 amendment, includes the following on-site and off-site components and activities:

- Open pit
- Mine maintenance facility
- Crushing and conveying system
- Processing plant
- Tailings distribution and management system
- Tailings storage facility
- Waste rock management facilities
- Water management facilities
- Access road and interchange
- On-site roads
- Borrow sources
- Transmission line and transformer upgrades
- Natural gas supply line
- Explosives manufacturing and storage facility
- Water supply, including pump house upgrades
- Process and potable water system
- Concentrate storage and shipping area
- Concentrate transport via truck to Port of Metro Vancouver.

On February 2, 2012, a multi-stakeholder CAG was established to provide a forum for dialogue and input on the EA process, review information regarding the proposed project, and provide input into and promote effective communication and engagement between government and specific interest groups and the public. The members of the Ajax Project Community Advisory Group (CAG) are identified in Table 20-2.

Table 20-2: Ajax Project Community Advisory Group Members

Organization	Organization
Aberdeen Community Association	Kamloops Fly Fishers' Association
Aberdeen Highlands Development Corporation	Kamloops Naturalist Club
BC Cattlemen's Association	Kamloops Physicians for a Healthy Environment
Coalition for the Preservation of East Kamloops	Kamloops Stockmen's Association
Ducks Unlimited	Lac Le Jeune Conservation Association
Grasslands Conservation Council of British Columbia	Pineview Community Group
Kamloops & District Fish & Game Association	Thompson Institute of Environmental Studies
Kamloops Area Preservation Association	Thompson Watershed Coalition
Kamloops Astronomical Society	TRU Faculty Association Human Rights Committee
Kamloops Exploration Group	

CAG meetings were chaired by the EAO. An initial meeting was held on February 2, 2012. Subsequent meetings were held: in February to discuss the EA process and review the public consultation plan; in March to review the coordinated EA process, CAG process, and CAG comments submitted on the draft Public Consultation Plan; and in April to provide feedback on the April 18, 2012 KAM public workshop. A later meeting was held in October 2012 to review the public issues tracking table and the socio-economic section of the dAIR/EIS guidelines.

20.1.1.3.1 Preparation of the Application

KAM's team prepared the Application/EIS between Q1 2014 and Q3 2015, and the Application/EIS was submitted to the BC EAO in September 2015.

20.1.1.3.2 Screening of the Application

When an Application/EIS is submitted by a proponent, the Executive Director must evaluate the Application/EIS for completeness and decide within 30 days whether to accept it for review; this is referred to as the screening period as required by the EAA (2002). The screening period may be extended at the discretion of the EAO or as requested by the proponent. During the screening period, it is possible that additional information or analyses are required before the Application/EIS can be accepted for review.

A Table of Concordance is submitted as part of an Application/EIS and is used by the EA Working Group to screen the Application/EIS against the AIR/EIS Guidelines to determine whether the required information has been adequately provided. If the EAO determines the Application/EIS to be insufficient, the Proponent is required to address the information deficiencies. If the Application/EIS contains all of the required information, the EAO will notify the proponent that the Application/EIS has been accepted for a formal, detailed review by the EA Working Group.

The screening period may be extended at the discretion of the EAO or as requested by the proponent. During the screening period, it is possible that the proponent will be required to provide additional information or analyses to meet the AIR/EIS Guidelines before the Application/EIS can be accepted for review.

KAM submitted its Application/EIS on September 11, 2015. On October 9, 2015 EAO granted a 38-day extension for the evaluation of the Application in response to KAM's request for an extension of the evaluation period to allow the Stk'emlupsemc te Secwépemc Nation (SSN) an additional 30 days for their evaluation of the Application. The extension also provided KAM the opportunity to provide clarification of the Tailings Storage Facility Alternatives Assessment information in light of the AIR and related direction from EAO's Associate Deputy Minister in March 2015.

On November 20, 2015 the EAO concluded that the Application/EIS, including the clarifications and additional information provided by KAM during the screening period, adequately reflects the requirements in the AIR, and decided to formally accept the Application for detailed review.

Prior to commencing the Application Review phase, KAM is responsible for ensuring the final Application reflects the clarifications and supplemental information that was provided during the screening period.

20.1.1.3.3 Application Stage

Under the EAA (2002), if the Application/EIS is accepted for review by the BC EAO, a legislated 180-day review period commences. The proponent provides paper and electronic copies of the Application/EIS to the EA Working Group, Aboriginal groups, public libraries, and other stakeholders as directed by the BC EAO. The Application/EIS is also uploaded to the BC EAO's e-PIC website to support public consultation requirements. KAM is targeting submission of the Application/EIS for formal review commencing January 2016.

During the review period, a public comment period on the Application/EIS will be held to provide the public with an opportunity to review and comment on the Application/EIS. The duration of the public comment period is established by the Executive Director under a section 11 Order. The proponent must have at least one formal comment period of 30 days, and must provide the Project Assessment Lead a written report on the results of its public consultation activities, identifying views, issues, and concerns raised by the public.

KAM will compile, track, and respond to public comments using an issues-tracking table. BC EAO's e-PIC website will post comments received during the public comment period. KAM will be required to submit a public consultation report within 30 days of the close of the Application/EIS comment period.

The Working Group may meet during the 180-day period to discuss substantive technical issues and to provide advice to KAM. Working group members will submit technical written comments for response by KAM, which can take the form of technical memorandums, issues-tracking tables, and/or addendums to the Application/EIS. KAM will be invited to participate in, and present information at the Working Group technical sub-committee meetings.

Aboriginal consultation activities will continue throughout the Application Review stage by both the provincial Crown and KAM. KAM will consult with the First Nations in accordance with the process described in Section 20.4.

Pursuant to Section 27(6) of the BC EAA, the BC EAO may suspend the 180-day review period if additional information is required from the proponent.

20.1.1.3.4 Assessment Report

During the latter stages of the Application review, the BC EAO prepares an Assessment Report that summarizes the residual effects of the proposed project, identifies proposed mitigation measures, evaluates the significance of residual, adverse effects, summarizes all public concerns and how they have been addressed, and identifies any outstanding issues. Also, the report summarizes all Aboriginal consultation issues raised during the EA process, along with the identification of any unresolved technical or consultation issues. The Assessment Report contains items for the relevant Ministers to consider when deciding if an EA Certificate should be granted.

The EA Certificate is comprised of a Certified Project Description (CPD) and Table of Conditions. The CPD is a description of the physical works of the Ajax Project and describes how the project must be constructed, operated, decommissioned, and reclaimed. The Table of Conditions will identify conditions that KAM must adhere to, in addition to identifying key mitigation measures and monitoring requirements that KAM must follow during different phases of the project.

BC EAO will provide copies of these reports to the Working Group, Aboriginal groups, and to KAM for their review and comment prior to being finalized and referred to Ministers for a decision.

20.1.1.3.5 Minister's Decision

The BC EAO will compile a referral package for the Minister of the Environment and the Minister of Energy and Mines that includes the Assessment Report and a draft EA Certificate. The Ministers' decision is made within 45 days of a referral and is posted to the BC EAO's e-PIC website. Once issued, the EA Certificate is a legally binding document granting conditional approval for the Ajax Project to proceed. Under Section 18 of the EAA (2002), the Proponent must have substantially started the project within five years of the issuance of the EA Certificate, or can apply for a one-time extension of the Certificate.

20.1.1.4 Provincial Milestones

The provincial EA process milestones that have been achieved to date are summarized in Table 20-3.

Table 20-3: Provincial Environmental Assessment Process Milestones for the Ajax Project

EA Process Milestones	Date
BC EAO receives Project Description for Review	December 6, 2010
BC EAO receives revised Project Description for Review	February 8, 2011
BC EAO issues Section 10 Order	February 25, 2011
KAM submits dAIR for BC EAO review	April 18, 2011
Initial Working Group Meeting	April 27, 2011
BC EAO receives updated Project Description	May 17, 2011
BC EAO submits first Order under section 11 for a first public comment period	June 3, 2011
KAM submits revised dAIR based on BC EAO comments	June 15, 2011
Public Comment Period on the Project Description	June 8 to July 11, 2011
BC EAO receives final Project Description	July 6, 2011
KAM submits revised dAIR based on public comments	August 11, 2011
Working Group Meeting #2	October 27, 2011
KAM submits updated dAIR based on Working Group comments	January 6, 2012
BC EAO issues additional section 11 Order	January 11, 2012
BC EAO and CEA Agency posts draft AIR/EIS Guidelines for Public Comment	January 11, 2012
Public Comment Period on dAIR/EIS Guidelines	January 11 to March 27, 2012
Health sub-working group meeting	January 24, 2012
Water quality sub-working group meeting	February 27, 2012
Health sub-working group meeting	May 10, 2012
BC EAO posts Ajax Community Consultation Plan	May 17, 2012
Approved AIR posted to e-PIC	June 25, 2013
Revised AIR posted to e-PIC	November 10, 2014
Public Comment Period on the revised AIR	November 18 to December 18, 2014
BC EAO issues Section 13 amendment	July 23, 2015
BC EAO approves AIR and posts to e-PIC	July 22, 2015
KAM submits Application/EIS for screening review	September 11, 2015
BC EAO initiates screening review of Application/EIS	September 14, 2015
BC EAO grants 38-day extension of screening review at KAM request	October 9, 2015
BC EAO concludes Application meets AIR requirements and accepts for detailed review	November 20, 2015

20.1.1.5 Federal Environmental Assessment Review Process

While there are no prescribed phases for a comprehensive study under CEAA (1992), a description of important milestones is provided below.

The federal EA process commenced with the submission of a Project Description (PD) on December 6, 2010. A revised PD was submitted on February 8, 2011, to address comments from the CEA Agency. Based on early feedback, Aboriginal and Public concerns, and continuing refinements to the project design, a revised version of the Project Description was submitted on May 17, 2011. The Ajax Project Description was screened and accepted for a 90-day review period by the CEA Agency for the purposes of determining whether a federal EA was required for the project. A final PD was submitted on July 6, 2011.

A Notice of Commencement (NoC) was issued by the CEA Agency on May 31, 2011, and later updated on January 10, 2012, and posted to the Canadian Environmental Assessment Registry Internet Site (CEARIS) stating that a federal EA of the Ajax Project was required. The NoC initiated the beginning of a 365-calendar day government time limit; under the Establishing Timelines Regulation, the “clock” can be stopped at the request of the proponent or the CEA Agency if it is deemed there is insufficient information for the EA process to proceed. As of the end of November 2015, there were 220 days of time remaining.

As required by the *Jobs and Economic Growth Act* (2010) amendments to CEAA (1992), a Background Information scoping document was posted to the CEARIS on June 1, 2011. The Background Information document identifies the scope of the assessment, factors to be considered, and information related to public participation and Aboriginal consultation. The Background Information document also provides the public with an opportunity to comment on the conduct of the comprehensive study. A public comment period was held between June 8 and July 11, 2011 to seek comments from the public on the project and its potential environmental effects, to ensure that relevant issues were identified for consideration in the Application/EIS. Based on early feedback and project design changes, the Background Information document was revised and posted to CEARIS on August 26, 2011.

As specified in Section 2.0 of the Background Information, the CEA Agency defines the scope of the project to include the following project components:

- Open pit
- Mine maintenance facility
- Crushing and conveying system
- Processing plant
- Tailings distribution and management system
- Tailings storage facility
- Waste rock management facilities
- Water management facilities
- Access road and interchange
- On-site roads
- Borrow sources
- Transmission line and transformer upgrades
- Natural gas supply line
- Explosives manufacturing and storage facility
- Water supply, including pumphouse upgrades
- Process and potable water system
- Concentrate storage and shipping area
- Concentrate transport via truck to Port of Metro Vancouver

20.1.1.5.1 Major Projects Management Office

The Major Projects Management Office (MPMO) was established in 2007 to provide overarching project management and accountability in the federal EA and regulatory review process. In accordance with the *Cabinet Directive on Improving the Performance of the Regulatory System for Major Resource Projects* (Government of Canada 2012), the project has been designated as a major resource project.

Under the Government of Canada’s Major Resource Project initiative, the MPMO is involved in the federal EA process and works with federal agencies to coordinate agreements and timelines and to track the federal regulatory review process. On August 2011, a Project Agreement was signed between federal authorities participating in the EA process for the project, which articulates the roles and responsibilities of each federal agency.

20.1.1.5.2 Environmental Impact Statement Guidelines

In line with the federal-provincial coordination process, the Proponent prepared a single document, the AIR/EIS Guidelines, identifying the information required to be submitted in the Application/EIS. The CEA Agency issued the draft AIR/EIS Guidelines for the Ajax Project on January 11, 2012, which was followed by a public comment period of 75 days from January 11 to March 27, 2012. The final Air/EIS Guidelines was issued on June 3, 2013. As described above in Section 20.1.1.3.1, the AIR/EIS Guidelines have since been revised due to project design changes and were re-issued on July 23, 2015.

20.1.1.5.3 Preparation of the Environmental Impact Statement

After the AIR/EIS Guidelines document is approved, the Proponent must complete all required baseline studies and conduct an effects assessment for each VC to determine whether the project is likely to result in any potentially significant adverse effects. Mitigation measures required to avoid, reduce, or control adverse effects are identified, in addition to any monitoring requirements. This submission of the Application/EIS satisfies this step. Public and Aboriginal consultation activities are ongoing during this period.

20.1.1.5.4 Screening of the Environmental Impact Statement

As prescribed in the Establishing Timelines for Comprehensive Studies Regulations (SOR/2011-139), the review of the Application/EIS starts with a 30-day screening by the CEA Agency to determine whether the information contained in the Application/EIS is complete. As members of the EA Working Group, the CEA Agency and federal agencies will conduct a 30-day screening period of the Application/EIS to determine whether the Application/EIS contains the information outlined in the EIS Guidelines.

If the CEA Agency determines the Application/EIS does not contain the required information, the proponent will receive an Information Request to address information deficiencies. If the Application/EIS contains all of the required information, the CEA Agency will "turn the government clock on" and proceed with a detailed review by the federal members of the EA Working Group.

KAM submitted the Application/EIS for screening review on September 10, 2015, and a 30-day conformity scan was initiated by the CEA Agency and federal reviewers. At the completion of the 30 days, CEA Agency provided KAM with feedback in the form of three tables: 1) required information that must be included prior to formal submission; 2) editorial comments and suggested improvements; and 3) preview of information requests that will likely come during the formal review. KAM is currently addressing as many of the comments as possible while finalizing the Application/EIS for formal submission.

20.1.1.5.5 Review of the Environmental Impact Statement

The proponent provides paper and electronic copies of the Application/EIS to the EA Working Group, Aboriginal groups, and other stakeholders as directed by the CEA Agency for detailed review. KAM is targeting submission of the Application/EIS for detailed review commencing January 2016.

During the review period, a joint federal-provincial public comment period on the Application/EIS will be held to provide the public with an opportunity to review and comment on the Application/EIS. Comments will be compiled, tracked, and responded to by KAM using issues-tracking tables, additional memorandums or addendums to the Application/EIS as needed. The EA Working Group reviews the responses provided by the proponent and determines whether the concerns have been adequately resolved. EA Working Group meetings and sub-working group technical meetings are held throughout the review of the Application/EIS to discuss and resolve outstanding technical issues. Aboriginal consultation activities by the provincial and federal governments and by KAM will be ongoing during this period.

20.1.1.5.6 Comprehensive Study Report (CSR)

The CEA Agency prepares a CSR that summarizes all residual effects of the project, identifies proposed mitigation, includes an evaluation of significance of adverse effects, summarizes all public concerns and how they have been addressed, and identifies outstanding issues. A summary of all Aboriginal consultation issues that were raised during the EA process is also included. The CSR is provided to the EA Working Group, to Aboriginal groups, and to the proponent for their review and comment. A final opportunity for the public and Aboriginal groups to comment on the federal CSR is provided over a 30-day public comment period via CEARIS.

20.1.1.5.7 Minister's Decision

The CSR is submitted to the federal Minister of the Environment seeking a decision under Section23(1) of CEAA (1992) for the project. After taking into consideration the CSR and any public comments, the Minister of the Environment will issue an EA decision statement that sets out:

- The Minister's opinion as to whether, taking into account the implementation of any mitigation measures that the Minister considers appropriate, the project is, or is not, likely to cause significant adverse environmental effects
- Any mitigation measures or follow-up program that the Minister considers appropriate.

The Minister then refers the project back to Responsible Authorities (RAs) to take their course of action decisions under Section 37 of CEAA (1992). In this case, the project will be referred back to Fisheries and Oceans Canada to take a course of action decision regarding an authorization under the *Fisheries Act* (1985b), and to Natural Resources Canada to take a course of action regarding issuance of a license under paragraph 7(1)(a) of the *Explosives Act* (1985a).

20.1.1.6 Federal Milestones

The federal milestones that have been achieved through the EA process to date are summarized in Table 20-4.

20.1.1.6.1 Federal Participant Funding Program

Pursuant to subsection 58(1.1) of CEAA (1992), a participant funding program (PFP) was established for comprehensive studies to facilitate the participation of the public and to support consultation activities for potentially affected Aboriginal groups in federal and joint EA processes. A Funding Review Committee (FRC), independent of the EA review process, is established to assess applications for funding, and to recommend funding allocations for applicants. Disbursements are allocated to support participation and/or consultation activities for both pre- and post-Application/EIS submission. Two funding envelopes are established: a Regular Funding Envelope (RFE) to support members of the public, and an Aboriginal Funding Envelope (AFE).

Table 20-4: Federal Environmental Assessment Process Milestones for the Ajax Project

Federal EA Process Milestones	Date
CEA Agency receives Project Description for Review	December 6, 2010
CEA Agency receives revised Project Description for Review	February 8, 2011
CEA Agency receives updated Project Description	May 17, 2011
CEA Agency determines Comprehensive Study required and commences EA	May 25, 2011
CEA Agency issues Background Information document	June 1, 2011
CEA Agency informs public federal funding is available*	June 14, 2011
CEA Agency holds public comment period on the Background Information document	June 8 to July 11, 2011
CEA Agency receives final Project Description	July 6, 2011
CEA Agency issues revised Background Information document	August 26, 2011
CEA Agency issues regular funding envelope to participate in the EA*	September 6, 2011
CEA Agency issues aboriginal funding envelope to participate in the EA*	October 21, 2011
CEA Agency issues additional regular funding envelope to participate in the EA*	December 14 2011
CEA Agency posts dAIR/EIS Guidelines to CEARIS	January 11, 2012
CEA Agency holds public comment period on the dAIR/EIS Guidelines	January 11 to March 27, 2012
CEA Agency posts final AIR/EIS Guidelines to CEARIS	January 3, 2013
CEA Agency issues additional aboriginal funding envelope to participate in the EA*	January 22, 2014
CEA Agency posts revised final AIR/EIS Guidelines to CEARIS	November 18, 2014
CEA Agency holds public comment period on revised AIR/EIS Guidelines	November 18 to December 18, 2014
CEA Agency issues Section 13 amendment to section 11 Order	July 23, 2015
CEA Agency posts final AIR/EIS Guidelines to CEARIS	July 22, 2015
KAM submits Application/EIS for conformity scan	September 11, 2015
CEA Agency initiates conformity scan of Application/EIS	September 14, 2015
CEA Agency completes 30-day conformity scan against AIR/EIS Guidelines and issues comments. An extension was requested and granted.	November 24, 2015

Funding from the AFE may be provided to Aboriginal groups who plan to engage in Aboriginal consultation activities with the federal government that are linked to the EA of a proposed project. The funds can be used to support their engagement in consultation activities and to provide input into the EA process. The RFE is established to provide funding for individuals, Aboriginal groups, and incorporated not-for-profit organizations to participate in the EA review process. Parties applying to either funding envelope must meet certain eligibility criteria:

- Have a direct, local interest in the project, such as a residence in the area or historical or cultural ties to the area likely affected by the project
- Have community knowledge or Aboriginal traditional knowledge relevant to the EA

Have expert information relevant to the anticipated environmental effects of the proposed project.

20.1.1.6.2 Aboriginal Funding Envelope

On October 21, 2011, a total of up to $329,700 was made available under the AFE for the project to support Aboriginal participation and related consultation activities in the EA, including:

- Preparing for and participating in internal community meetings
- Preparing for and participating in consultation meetings
- Reviewing and commenting on the dAIR/EIS Guidelines
- Reviewing and commenting on the Application/EIS
- Reviewing and commenting on the CSR.

Five Aboriginal groups applied for funding; all groups were found to be eligible for PFP-AFE funding, and the total amount of $329,700 was granted to support Aboriginal participation in the EA and related consultation and community engagement activities. The FRC's decision was posted on CEARIS on October 21, 2011.

On January 22, 2014, an additional $40,000 was allocated to the Whispering Pines/Clinton First Nation, Shushwap First Nations. The allocated funds are identified in Table 20-5.

Table 20-5: Participant Funding Program Allocations – Aboriginal Funding Envelope

Applicant	Allocation
TK'emlups (Kamloops) Indian Band	$147,050
Skeetchestn Indian Band #687	$102,000
Lower Nicola Indian Band	$30,150
Métis Nation British Columbia	$25,700
Ashcroft Indian Band	$24,800
Whispering Pines/Clinton First Nation	$40,000
Total	**$369,700**

20.1.1.6.3 Regular Funding Envelope

On June 14, 2011, a total of up to $50,000 was made available under the RFE to facilitate the participation of the public in the Comprehensive Study EA review process, including:

- Attending community-specific meetings (e.g., open houses)
- Reviewing and commenting on the Application/EIS
- Reviewing and commenting on the CSR prepared by the CEA Agency.

Three applications were received; all were found to be eligible for PFP-RFE funding, and a total of $32,225 was granted to support public participation in the EA. The FRC's and the President of the CEAA's decision was posted on CEARIS on September 6, 2011. Another application was reviewed, and on December 14, 2011, an additional amount of $15,915 was granted to the Sierra Club BC. The total allocated funds are identified in Table 20-6.

Table 20-6: Participant Funding Program Allocation – Regular Funding Envelope

Applicant	Allocation
Grasslands Conservation Council of British Columbia, on behalf of the Kamloops Naturalist Club and the Kamloops District Fish and Game Association	$18,700
Sharon Antoniak on behalf of Kamloops Area Preservation Association	$11,950
Susan McGillivray	$1,575
Sierra Club BC	$15,915
Total	**$48,140**

20.1.1.6.4 Environmental Assessment Status

The Application/EIS was submitted for screening/conformity review in September 2015 and was subsequently determined as being complete by both the EAO and the CEA Agency. At the time of writing, KAM was finalizing the Application/EIS to reflect clarifications and additional information provided during the screening period and is targeting submission of the updated Application/EIS for detailed review to commence in January 2016.

20.1.2 Permits & Approvals

Beyond the environmental assessment process, the project will require multiple permits and approvals for construction, operation, and closure of the project. The following summarizes the relevant legislation that serves as the basis for the identified applicable permits.

20.1.2.1 First Nations Consultation & Accommodation

Before issuing authorizations for any project activity, the Province has a legal responsibility to consult and, where appropriate, accommodate First Nations with aboriginal interests in the proposed project area. The Province also has treaty-specific responsibilities where there are established treaty rights. The scope of each responsibility is project-specific.

Proponent-driven initiatives and committee activities can contribute to the consultation process through:

- First Nations participation as members of the Mine Review Committee (MRC)
- Accommodation through recommendations leading to permit conditions
- Proponent funding of Cultural Heritage or other First Nation studies
- Proponent outreach and information sharing
- Proponent – First Nation agreements
- Proponent initiatives to address non-technical issues raised by First Nations
- Government – First Nations agreements.

Accommodation, where appropriate, can include a range of mitigation and environmental protection and management strategies developed by the committee, or through other forums established through negotiated agreement between the Province and affected First Nations. The current status of First Nations consultation is outlined in Section 20.4.2.

20.1.2.2 British Columbia Mines Act

The BC *Mines Act* (1996e) require mining operations to carry out a program of environmental protection and reclamation to return, where practical, land, watercourses, and cultural heritage resources to a safe and environmentally sound state and to an acceptable end land use upon termination of mining.

The Act is administered by the Ministry of Energy and Mines (MEM). The Chief Inspector of Mines has authority for all permits and approvals under the *Mines Act* and the Code. Proponents of mining projects are required to obtain a permit from the MEM prior to commencing any work on a mine site, in accordance with section 10 of the *Mines Act* (1996e). Section 10 of the *Mines Act* requires that a permit application must include “a plan outlining the details of the proposed work and a program for the conservation of cultural heritage resources and for the protection and reclamation of the land, watercourses and cultural heritage resources affected by the mine, including the information, particulars and maps established by the regulations or the code” (Section 10.1). As a condition of issuing a permit, the Chief Inspector may require a financial security for mine reclamation, and to provide for protection of, and mitigation of damage to, watercourses and cultural heritage resources affected by the mine (Section 10.4).

20.1.2.3 Water Act

In BC, ownership of water is vested in the Crown as stated in the BC *Water Act* (1996f). The Act is the principal law for managing the diversion and use of Provincial water resources. Under the Act, approvals are required for making changes in and about a stream, to authorize construction of works, and the diversion and use of water and water withdrawals. The project surface water management system will be constructed, operated and closed in compliance with the *Water Act*.

20.1.2.4 Land Act & Transportation Act

The Ministry of Forests, Lands and Natural Resource Operations administers the *Land Act* (1996c) and is responsible for the sale, lease and license of Crown lands throughout BC. Tenure for the use of provincial Crown land for highway operations and construction, including the disposition of Crown land by lease, license of occupation, right-of-way and easement, is issued under the Act. Activities related to highway development that are often undertaken on Crown land include geotechnical field investigations; construction of a temporary access road; establishment of a borrow pit or a quarry; and construction of a road or highway.

Section 48 of the *Transportation Act* (2004a) is used to designate some highways as “controlled access highways” and these are usually numbered routes and are intended to carry higher volumes of inter-regional traffic. The Ministry of Transportation and Infrastructure has developed a Controlled Access Strategy that applies along controlled access highways and in controlled areas. The intent of Controlled Access highways and Controlled Areas is to preserve a reasonable level of service to long-trip vehicles on the major highway and street system, and to enhance safety.

20.1.2.5 Environmental Management Act

The Ministry of Environment administers the *Environmental Management Act* (2003a) which prohibits the discharge of waste to the environment unless specifically authorized. While there are different types of authorizations issued under the Act, most mining operations require air emissions, solid refuse, and effluent discharge permits.

A permit is required to authorize the discharge of wastes from an industry, trade, business, operation, or activity to the environment, and sets the terms and conditions under which the discharge may occur so that pollution is prevented. The terms and conditions include limiting the quantity and quality of waste contaminants, monitoring the discharge and the receiving environment, and reporting information to the Ministry. Permits are ongoing authorizations and may be amended, transferred to other dischargers, suspended or cancelled.

20.1.2.6 Forest Act

The BC Ministry of Forests, Lands and Natural Resources is the principal government agency which regulates the use of B.C.'s public forest, and administers the *Forest Act* (1996a). The Ministry's objective is to protect, manage and conserve B.C.'s diverse forest resources on an environmental, economically and socially sustainable basis.

Trees on Crown land may not be cut without a permit under the Act. An Occupant Licence to Cut is issued where a person has the legal right to occupy Crown Land through another form of Crown land tenure. As the other forms of *Land Act* (1996c) tenure do not provide the legal right to harvest the timber, a permit under the *Forest Act* is required.

20.1.2.7 Mineral Tenure Act

The BC Ministry of Energy and Mines regulates the province's mineral rights through the *Mineral Tenure Act* (1996d). The *Mineral Tenure Act* is the primary statute that authorizes the registration of mineral tenures with the Province and provides the policy framework for the administration of mineral titles.

20.1.2.8 Fisheries Act

The Fisheries and Oceans Canada (DFO) administers the *Fisheries Act* (1985b) and amendments to this legislation in 2012 established new Fisheries Protection Provisions which focus on the management of threats to the sustainability and productivity of commercial, recreational and Aboriginal fisheries, or to fish that support such a fishery. Subsection 35(1) of the *Fisheries Act* prohibits the carrying on of a work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery or to fish that support such a fishery. However, under Paragraph 35(2)(*b*) of the *Fisheries Act*, the Minister of Fisheries and Oceans may issue an authorization with terms and conditions in relation to a proposed work, undertaking or activity that may result in serious harm to fish.

20.1.2.9 List of Permits & Approvals

In order to support the early stages of construction activity, select permits under these legislative instruments will be prepared in parallel with the Application/EIS and submitted to government at during the review of the Application/EIS. Administration of provincial authorization processes will be facilitated by BC Ministry of Energy and Mines Major Mine Permitting Office (MMPO) and a project specific Mine Review Committee (MRC). Federal approvals are obtained separately in coordination with the CEA Agency MPMO. The MMPO (provincial) and MPMO (federal) have committed to work with KAM towards an efficient permit review process. KAM has initiated discussions with the MMPO regarding permitting of the

Project and establishment of the MRC. Once the MRC is established it will confirm the list of permitting requirements and develop a schedule for the submission, review, and issuance of permits. Table 20-7 summarizes these permits that would be needed over mine life. The list of required permits is preliminary and subject to change via discussions with regulatory agencies.

Table 20-7: Permits Applicable to the Ajax Project

Enabling Legislation	Authorization or Permit	Facility or Infrastructure	Activity
Provincial Permits			
Mines Act	*Mines Act* Permit	Facilities and infrastructure within the Mine Lease	Authority for the construction, operation, and closure of the Project.
Mines Act and Code (part 8)	Explosives Magazine Storage and Use permit	Explosives Magazine	Approval to store, transport and use explosives and maintain the explosives magazine. Does not include authorization of explosives manufacture in on site factory or storage of ammonium nitrate for explosives production.
Mineral Tenure Act	Mining Lease	N/A	Conversion of mineral claims for long-term production of ore.
Environmental Management Act	Operations Permit Waste Discharge – Effluent	Plant and Tailings Storage Facility	Authority for operational discharge of tailings into TSF.
Environmental Management Act	Air Emissions Discharge Permit	Ore Processing Facilities	Authority for operational discharge of particulate matter via dust from ore processing facilities. Permit to include conditions for management of non-point source emissions related to fugitive dust.
Environmental Management Act	Amendment of PE 39-04 Waste Discharge Permit - Effluent	Sediment control ponds	Amendment to Permit 39-04 currently held by KGHM-Ajax for sediment discharge during construction.
Environmental Management Act	Amendment of PE 39-04 Waste Discharge Permit - Air	N/A	Amendment to Permit 39-04 currently held by KGHM-Ajax for non-point source dust produced during construction.
Environmental Management Act	Independent Remediation Notification	Land treatment facility	Notification for operation of land treatment facility for remediation of hydrocarbon contaminated soil on site.
Environmental Management Act - Hazardous Waste Regulation	Hazardous Waste Registration	Hazardous waste transfer facility, plant, truck shop	Registration and application for to produce, store, treat, recycle or discharge hazardous wastes including hydrocarbons (waste oil, grease, antifreeze hydraulic fluid, etc.), solvents, fluorescent lamps, lead cupels, used batteries and biomedical waste.
Environmental Management Act	Waste Discharge Permit – Solid Waste	Selected waste landfill	Disposal of demolition, land clearing and construction (DLC) debris; and solid industrial wastes (excluding all hazardous wastes). Selected wastes will be co-disposed of with mine rock within the South Mine Rock Storage Facility.
Environmental Management Act	Fuel Storage Registration	Fuel storage tanks	Storage of 550,000 liters of diesel fuel and 28,000 liters of gasoline.
Environmental Management Act - Municipal Sewage Regulation	Sewage Registration	Sewage treatment plants	Construction and operation of two modular sewage treatment plants at process plant and truck shop. Sewage treatment plants are modular and will be installed during site construction. Treatment will discharge Class C effluent to lined site contact water management ponds and the TSF for use as reclaim water in the processing circuit. Effluent will not be discharged to the environment. Sewage from additional facilities will be collected in septic tanks and pumped and transferred by truck to site sewage treatment plants for treatment. Sewage sludge from plants will be collected and transported to the City of Kamloops sewage lagoons for disposal.
Heritage Conservation Act	Site Alteration Permits	Multiple	Construction and operation of multiple facilities and infrastructure will result in the alteration, recover or destruction of approximately 24 archaeological sites.

Enabling Legislation	Authorization or Permit	Facility or Infrastructure	Activity
Forest Act	Occupant Licence to Cut	Multiple	Authority to cut and remove trees on 12 crown land parcels that will be cleared for the Inks Lake Interchange, explosives factory, site access road and ROW north of pit, open pit, east mine rock storage facility, west mine rock storage facility, south mine rock storage facility, tailings storage facility and power line ROW. Includes crown land parcels that are within and outside of the proposed mine lease boundary.
FPC Act – Provincial Forest Use Regulation	Special Use Permit	Multiple	Authority to construct access roads on Crown lands designated as forest lands outside the Mines Act permit area for Inks Lake interchange, Inks Lake offsetting, intake on Kamloops Lake and utility corridor right of way.
Land Act	License of Occupation – Statutory Right of Way	Water Intake on Kamloops Lake and freshwater pipeline	Construction of water intake and freshwater pipeline within Crown land outside of proposed mining lease/*Mines Act* permit area boundary.
Land Act	License of Occupation – Statutory Right of Way	25 kV Power line through Crown land	Construction of 25kV power line within Crown land outside of proposed mining lease/*Mines Act* permit area boundary.
Land Act	License of Occupation	Inks Lake Fish Habitat Offsetting Works	Construction of habitat offsetting works on Inks Lake including excavation of south basin, infilling of north basin, excavation of inflow and outflow channels, construction of recreational fishing access and parking lot.
Land Act	Grazing Lease Amendment	Open Pit, South Mine Rock Storage Facility, West South Mine Rock Storage Facility, Tailings Storage Facility	Authority to amend the grazing lease for temporary non grazing use of specific parcels that will be used post closure of mining facilities after reclamation for grazing purposes.
Water Act, Water Regulation	Water License under Land Improvement Purpose	Open Pit, SE Dam Jacko Lake, Contact Water Management Pond (Central Collection Pond)	Diversion of section of upper Peterson Creek on mine site.
Water Act, Water Regulation	Notification of “changes in or about a stream” (S.8/S.9)	Freshwater Pipeline and 25kV Power Line Right of Way	Works in and about un-named streams outside of mine lease (west of project footprint) and subject to Section 10 of *Mines Act*.
Water Act, Water Regulation	Notification of “changes in or about a stream” (S.8/S.9)	Power line Right of Way	Works in and about un-named streams outside of mine lease and subject to Section 10 of Mines Act permit.
Water Act, Water Regulation	Water Licence	Peterson Creek Diversion System	Diversion of upper section of Peterson Creek. Authority to install intake in Jacko Lake, divert Peterson Creek flows into buried pipeline and discharge into a constructed water storage pond on Peterson Creek.
Water Act, Water Regulation	Water Licence	Peterson Creek Downstream Pond	Authority to store surface water for irrigation purposes. Downstream pond will serve as non-contact surface water reservoir and an integral part of Peterson Creek Diversion System to allow water bailiff control of water levels in Jacko Lake for existing water license holders.
Water Act, Water Regulation	Water Licence	Temporary construction dam and permanent dam	Authority to construct temporary sheet pile dam and permanent embankment on NE arm of Jacko Lake.

Enabling Legislation	Authorization or Permit	Facility or Infrastructure	Activity
		on NE arm of Jacko Lake	
Water Act, Water Regulation	S 18 Amendment of Existing Water Licences	Dam on SE arm of Jacko Lake	Authority to construct permanent embankment on SE arm of Jacko Lake. Dam will replace existing dam slightly downstream with same spillway elevation.
Water Act, Water Regulation	S 18 Amendment of Existing Water Licences	Dam on west arm of Jacko Lake	Authority to construct permanent embankment on west arm of Jacko Lake. Dam used to retain probable maximum flood.
Water Act, Water Regulation	Water Licence	Fresh water supply system to mine site	Approval for upgrade of existing infrastructure and construction of new project components for fresh water supply and consumptive use of water from Kamloops Lake for mineral processing, potable water supply and water source for Inks Lake fish habitat offsetting.
Water Act, Water Regulation	Water Licence	Inks Lake Fish Habitat Offsetting Works	Construction of habitat offsetting works on Inks Lake including excavation of south basin, infilling of north basin, excavation of inflow and outflow channels, construction of recreational fishing access and parking lot. Crown land parcels include: portion of the NW ¼ of Section 16, Township 19, Range 18 West of the 6th Meridian Kamloops Division Yale District and a portion of SE ¼ of Section 20, Township 19, Range 18 West of the 6th Meridian Kamloops Division Yale District.
Transportation Act	Access and Works on MOTI ROW	Access to Ajax Mine Access Road from private road to Explosives Factory	Approval for access to Ajax Mine Access road to be public road from intersection with private road to Explosives Manufacturing Facility.
Transportation Act	Access and Works on MOTI ROW	Ajax Mine Access Road (currently private) and Intersection with Lac Le Jeune Road	Replacement of multi-plate culvert overpass with concrete bridge overpass, reconstruction of approximately 50m of the existing Ajax Mine Access Road (AMAR) on the approaches to the new overpass, construction of approximately 300 m of a new link road to replace the existing intersection of Lac Le Jeune Road with Inks Lake Road. The new road will connect the AMAR to LLJR north of the overpass, construction of approximately 50 m of new link road east of the overpass between the AMAR and Jacko Lake Road, construction of approximately 50 m of new link road between the AMAR and Inks Lake Road west of the overpass, decommissioning of Inks Lake Road intersection with LLJR, and a section of the unnamed road for 175m east of the intersection, vesting the new overpass and approximately 650m of the AMAR between the new Jacko Lake Road link road and the new Inks Lake Road link road as public road.
Transportation Act	Access and Works on MOTI ROW	Highway Interchange	Approval to construct new Inks Lake Highway 5 Interchange north of existing interchange to provide direct access from Highway 5 to mine site.
Transportation Act	Access/Controlled Area Approval	South Park and Ride Facility	Approval to operate the South Park and Ride facility that will access Highway 5 and the Ajax Mine Access Road that will be a public road. The facility will be located on Lot 2 off of the Ajax Mine Access Road and will be accessed from the Inks Lake Interchange from Highway 5. Lot 2 is crown land. The lot will consist of 375 parking stalls with a dedicated bus entrance; pull in slots and turning bulb.
Transportation Act	Access/Controlled Area	North Park and Ride	Controlled area access for the North Park and Ride facility that will indirectly

Enabling Legislation	Authorization or Permit	Facility or Infrastructure	Activity
	Approval	Facility	access Highway 5. The facility will be located on lot 164 of the T'Kemlups Indian Band reserve land and is approximately 4 ha and accessed off east Shuswap Road from Highway 5. The lot will consist of 375 parking stalls with a dedicated bus entrance; pull in slots and turning bulb.
Transportation Act	Access/Controlled Area Approval	Construction RV Park and Park and Ride Facility	Controlled area access for the Construction RV park and Park and Ride facility that will indirectly access Highway 5. A recreational vehicle park for construction trades contractors will be developed at the KXA fairgrounds at 485 Mount Paul Way with is located on T'Kemlups Indian Band reserve land. The facility will consist of 300 RV pads with power, potable water and sanitary sewer connection. The site will include a centrally located office, laundry and recreational complex with washrooms and shower facilities. A parking lot for 375 vehicles will be included adjacent to the RV park and will include dedicated bus entrance, pull in slots and turning bulb.
Transportation Act	Access and Works on MOTI ROW	230 kV power line to plant	Authority to construct powerline crossings of MOTI Right of Way – Highway 5A. Crossing of Highway 5A may require municipal ROW approval.
Transportation Act	Access and Works on MOTI ROW	Water pipeline from Kamloops Lake to Plant	Authority to construct waterline crossings of MOTI Right of Way – Highway 1, Highway 5 and Lac Le Jeune Road.
Transportation Act	Access and Works on MOTI ROW	25 kV Power Line from Kamloops Lake to Site	Authority to construct power line crossings of MOTI Right of Way – Highway 1, Highway 5 and Lac Le Jeune Road.
Transportation Act	Road Closure	Tailings Storage Facility	Approval to close section of Goose Lake Road prior to construction and operation of tailings storage facility.
Drinking Water Protection Act	Construction Permit	Potable water treatment	Approval to construct potable water treatment facility.
Drinking Water Protection Act	Operating Permit	Potable water treatment	Approval to operate potable water treatment facility.
Public Health Act-Sewerage System Regulation 326/2004	Holding Tank Permit	Septic holding tanks at gate house, crushing facilities and mine dispatch	Approval(s) for construction of septic holding tank(s).
Agricultural Land Commission Act	Amendment to temporary change to non-agricultural use	Multiple	Temporary non-agricultural use of land for mining purposes in the Agriculture Land Reserve within the City of Kamloops – explosives manufacturing facility.
Agricultural Land Commission Act	Amendment to temporary change to non-agricultural use	Multiple	Temporary non-agricultural use of land for mining purposes in the Agriculture Land Reserve outside the City of Kamloops – works within the Mines Act Permit Area.
Agricultural Land Commission Act	Transportation and Utility Use in the ALR	Multiple	Authorize off-site transportation or utility use in the ALR, for power lines, water pipeline, access road within the City of Kamloops.
Agricultural Land Commission Act	Transportation and Utility Use in the ALR	Multiple	Authorize off-site transportation or utility use in the ALR, for power lines, water pipeline, access road outside of the City of Kamloops.
Agricultural Land Commission Act	Permanent removal	Open pit	Permanent removal of land from Agriculture Land Reserve for non-farm use of land associated with open pit that will not be reclaimed after mine closure.
Motor Vehicle Act	Approvals for oversize	N/A	Approvals for oversize loads or bulk haul applications (including ammonium

Enabling Legislation	Authorization or Permit	Facility or Infrastructure	Activity
	loads or bulk haul		nitrate) as required and to be acquired by contractor.
Weed Control Act	Noxious Weed Control Permit	N/A	Chemical control of invasive plants on site during construction and operation as required and to be acquired by contractor.
Wildlife Act	Wildlife Handling Permit	N/A	Handling wildlife for relocation during construction as required and to be acquired by contractor.
Wildlife Act and Angling and Scientific Collection Regulation, BC Reg, 125/90	Fish Salvage Permit	N/A	Fish salvage at Peterson Creek as required and to be acquired by contractor.
Public Health Act – Sewerage System Regulation 326/2004	Filing of Certification Letter	Sewage Treatment Plants	Treatment of raw sewage; effluent to be used as process water and sludge disposed of off-site.
Federal Permits			
Explosives Act	Explosives Manufacturing License and Certificate for the blending of ANFO	Explosives Factory	Manufacture of ANFO and emulsion explosives products required for blasting mine rock and ore. License will be acquired by contractor.
Explosives Act	Explosives Transportation License	Explosives Factory	Transportation of bulk explosives products. License will be acquired by contractor.
Explosives Act	Explosives Magazine License	Explosives Magazine	Storage of packaged explosives on site. License will be acquired and held by KGHM Ajax.
Radio Communications Act	Radio Licenses	Mine Dispatch	Dedicated radio frequency for mine site operations and emergency response communications
Atomic Energy Control Act	Radioisotope License	Processing Plant	Nuclear Density Gauges/X-ray Analyzers
Fisheries Act	Authorization for serious harm to fish habitat	Peterson Creek Diversion, Jacko Lake Dams, Inks Lake Fish Habitat Offsetting Works	Diversion of a section of upper Peterson Creek, construction of a water retaining embankment on upper Peterson Creek, construction of a water dam on the NE and SE arms of Jacko Lake, dewatering a portion of the NE arm of Jacko Lake.

20.2 Environmental Studies

Environmental studies were initiated for the Ajax Project in 2006, including ground and surface water quality and quantity, meteorology, air quality, fish and fish habitat, wildlife, and vegetation studies. The following provides a summary of the environment surrounding the Ajax Project.

The Ajax Project is located within the Thompson Basin; a warm and very dry, low-elevation area of predominantly gentle slopes with elevations in the project area ranging from approximately 800 to 1,130 masl. The project area consists of rolling grasslands and timber at the higher elevations. Sugarloaf Hill is the prominent landform in the area with an elevation of 1,130 m. The project area spans the Interior Douglas Fir (IDF), Bunchgrass (BG) and Ponderosa Pine (PP) biogeoclimatic zones and is characterized by rolling grasslands and timber at higher elevations. The IDF zone is primarily forested with Douglas Fir; it occurs in the southern portion of the project area and on Sugarloaf Hill at higher elevations. The BG zone is characterized by hot, dry conditions and encompasses the central and northeast portions of the project area. The PP zone occupies low elevation dry valley areas between the IDF and the BG zones within the project area.

The project area is located within the Peterson Creek watershed. Peterson Creek drains into the South Thompson River near its confluence with the North Thompson River, to the east of Kamloops Lake. At Kamloops, the South Thompson River and the North Thompson River converge to form the Thompson River which flows west from Kamloops Lake, then southwest to its confluence with the Fraser River near Lytton, BC. Additionally, alkaline lakes and small intermittent drainages are relatively common in the area.

Through comprehensive environmental assessment studies, KAM and its team have systematically identified issues of concern; scoped potential sources of effects and effects mechanisms and evaluated their potential to affect environmental, social, heritage, and health Valued Components (VCs); and assessed the capacity of various mitigation measures to prevent effects or, where not possible, to reduce them to acceptable levels. With mitigation measures applied, KAM's team of experts has then determined the residual effects on the project setting, and whether or not these residual effects are significant. Summaries of the effects assessments for environmental, social, health, and heritage VCs are provided in the following sections. Further details are contained within the Application/EIS.

It is important to note that the assessment of potential effects used for the purpose of the assessment conducted for the Application/EIS is purposely conservative so as to amplify potential effects on the receptors. That said, deviations between the design and performance of the project as described in this Technical Report and that reported in the Application/EIS are not considered to be material in nature.

The project is subject to review and approval by both the federal and provincial governments in order to proceed to development. It is through these public processes that the environmental and social feasibility of the project will ultimately be determined.

20.2.1 Assessment of Potential Environmental Effects: Summary & Conclusions

Environmental Valued Components span a range of topics, including physical components such as: greenhouse gas management; geology, landforms and soils; and water (surface water and groundwater, quality and quantity); as well as biological components such as: fish; plants and ecosystems; and wildlife. The following sections present a summary of the findings presented in the Application/EIS.

20.2.1.1 Greenhouse Gas Management

The Ajax Project is anticipated to emit up to 123 kt CO_2eq/a during the operation phase and up to 82 kt CO_2eq/a during the construction phase. The effects assessment compared the project-related GHG emissions to provincial and national reported emissions and with comparable proposed and operating mining projects in BC to determine the significance of the residual effect and significance of the residual cumulative effect. The project will increase atmospheric GHG emissions even after the application of mitigation measures, though the predicted residual GHG emissions are considered to be negligible and assessed as not significant (minor). In the context of provincial emissions levels and targets, the residual cumulative effects of the project are considered to be negligible and determined to be not significant (minor).

20.2.1.2 Geology, Landforms & Soils

Altered baseline landforms are the potential residual effect expected to be caused by the project. The project will affect slope gradients and topographic function of the landscape, however the compact project footprint and the reclamation of the project area would reduce the overall effect. The distribution of baseline topographic conditions would not be re-established; however, upon reclamation, the final landscape would support the reclamation and closure goals. Following implementation of mitigation measures, residual effects, in the form of new topographic features and improved or enhanced aquatic habitat, are expected to remain for the alteration of landforms indicator. All residual effects on geology, landforms and soils are expected to be not significant (minor) after mitigation measures are applied. The residual effect of Alteration of Baseline Landforms was carried forward into the cumulative effects assessment to be examined together with other activities surrounding the project (e.g., expansion of the Trans Mountain Pipeline). The cumulative effect after mitigation will result in a non-significant (minor) effect.

20.2.1.3 Surface Water Quality

The project has the potential to affect surface water quality as a result of dustfall deposition and the migration of uncaptured seepage and runoff (contact water) into nearby surface water bodies. A predictive water quality model was developed for the project to estimate parameter concentrations within the various mine water management ponds and in the downstream surface water features (Jacko Lake, Peterson Creek, and Humphrey Creek) over time. The model is fully integrated with the outputs from the groundwater flow model and the water balance model. Mitigation measures to reduce dustfall, seepage and runoff loading to surface water have been implemented into the construction, operation, and reclamation of key mine components. Residual effects on surface water quality were identified in Humphrey and Peterson Creeks for parameters including chloride, sulphate, copper, molybdenum, and selenium. Residual effects are considered not significant (minor to moderate) and the magnitude of the predicted change attributed to the project indicates that there are no residual cumulative effects on surface water quality.

20.2.1.4 Surface Water Quantity

A combination of modelling techniques, which included a water balance model were employed to assess the potential effects of the project on surface water quantity. A number of surface water quantity indices were selected for evaluation, with a primary focus on lower Peterson Creek and Kamloops Lake flow volumes. Annual streamflow volumes in lower Peterson Creek will be reduced in the order of 9% under average precipitation conditions. Residual effects on surface water quantity due to project activities are predicted to be not significant (moderate) for annual flow volumes and low flows, and not significant (minor) for monthly flow distribution and peak flows. Residual and cumulative effects on surface water quantity at Kamloops Lake due to project activities are predicted to be not significant (minor) for all water quantity metrics.

20.2.1.5 Groundwater Quality

There is the potential to affect groundwater quality in close proximity to the project as a result of uncaptured seepage (contact water) migrating into local groundwater. Changes in groundwater quality were assessed by modelling the change in parameter concentrations to the nearest down-gradient residential water supply well, and increases in groundwater fluoride, sulphate, copper, iron, manganese, molybdenum, and zinc concentrations were predicted in this vicinity. Mitigation measures to reduce seepage loading to groundwater have been implemented into the construction, operation, and reclamation of key mine components. The significance of the residual effects on groundwater quality are assessed in terms of the cumulative effect on the Human Health VC with the groundwater quality model results used as inputs to the contributing Domestic Water and Country Foods VCs, as components of the Human Health VC. Significance is also determined indirectly through the Surface Water Quality VC as seepage and groundwater discharge to surface water are accounted for in the predictions for that VC.

20.2.1.6 Groundwater Quantity

Groundwater quantity was selected as a VC for its importance to humans for drinking water, livestock and irrigation water, and for its importance for ecological and aquatic habitats. The baseline groundwater hydrology assessment identified 13 mapped aquifers and 495 registered water wells in the region. Based on the results of a detailed groundwater flow model, the project is expected to alter groundwater elevations, patterns of groundwater recharge and discharge, and patterns of groundwater flow within approximately 2 km of the Mine Site. However, the residual effects to groundwater quantity are predicted to be not significant (moderate). Cumulative effects to groundwater quantity from existing activities, project activities combined with future ranching, agriculture, and domestic water use within 2 km of the Mine Site would not be significantly different from the anticipated effects from existing activities and project activities. Therefore, the residual effects to groundwater quantity due to cumulative effects are predicted to be not significant (moderate).

20.2.1.7 Fish Populations & Fish Habitat

The project has the potential to affect fisheries and fish habitat due to the proximity of project components to Jacko Lake and Peterson Creek, and the location of the water intake pipe on Kamloops Lake. The likely mechanisms or pathways through which interactions occur between the project and the fish and fish habitat VC were identified. Mitigation measures were then identified, including design changes, implementing industry best management practices to avoid serious harm, and providing restoration or offsetting where serious harm could not be mitigated or avoided. The proposed offsetting plan accounts for loss of habitat in Jacko Lake (northeast arm) and the diverted section of Peterson Creek. Assessment of the remaining residual effects (direct and indirect habitat loss, fish mortality, and water quality and quantity) showed these effects to be not significant (minor to moderate) at both the project and cumulative levels.

20.2.1.8 Rare Plants

Rare plants were addressed as a VC to determine if an interaction with project activities could result in adverse residual effects. Potential effects of habitat loss and habitat alteration were identified and evaluated in relation to anticipated project activities. Several of the rare plants recorded in the study are the only known occurrences in the region. Protection of unaffected plants and potential translocations of regionally rare species will reduce the effect; however, the effect will not be mitigated completely. There is limited information on the abundance and distribution of these rare plants in the province and KAM has committed to supporting additional regional surveys for rare plants. The loss of rare plant occurrences due to the project is assessed to be not significant (moderate). The residual effects on rare plants were carried forward into cumulative effects assessment to be examined together with other activities surrounding the project (e.g., expansion of the Trans Mountain Pipeline, agriculture, ranching, forestry and the expansion of the city of Kamloops). The cumulative effect after mitigation will result in a not significant (moderate) effect.

20.2.1.9 Rare & Sensitive Ecological Communities

Rare and sensitive ecological communities and habitats are defined as wetlands, alkali ponds, old-growth forests, rock outcrops, and ecological communities at risk. The effects on rare and sensitive ecological communities is largely related to disturbances to soil moisture and nutrient regimes from project activities. Mitigation and reclamation to reduce the impact of the project on rare and sensitive ecological communities cannot fully mitigate for the loss of habitat during the construction phase of the project (i.e. clearing, grubbing and earthworks) and a residual effect of habitat loss is anticipated. A program of wetland compensation is proposed to address unavoidable loss to wetlands. Implementing management plans that address fugitive dust, invasive species, and hydrological changes is anticipated to mitigate the adverse effects associated with habitat alteration. With the application of mitigation measures, at both the project and cumulative levels, habitat loss of rare and sensitive ecological communities is considered to be a not significant (moderate and minor respectively) effect.

20.2.1.10 Grasslands

Grasslands were assessed as a VC to determine likely interactions with specific project activities, and how these interactions could result in any adverse effects. Habitat loss and habitat alteration arising from each project activity were identified and evaluated. Closure planning for the project includes objectives of re-establishing grassland communities on reclaimed areas. After the implementation of mitigation measures, habitat loss was found to have a potential residual effect and was assessed for potential interactions with other past, present, and future projects and activities occurring within the region. Habitat loss is considered not significant (moderate) for project-related residual effects. Regionally, habitat loss is considered not significant (minor) for cumulative residual effects as less than 3% of the priority grassland areas within the Regional Study Area (RSA) will be lost, and suitable habitat still exists within the region.

20.2.1.11 Terrestrial Invertebrates

Terrestrial invertebrates were assessed to determine potential interactions between project activities and indicator species. No residual adverse effects are anticipated as a result of the project. No observations of the listed indicator species were recorded in the study area, despite extensive survey effort by a species expert. No population level effects to California hairstreak, common sootywing, monarch, Nevada skipper and olive clubtail populations are anticipated. Effects of the project to these species are not anticipated to have an adverse residual effect on the VC. As no residual effects are anticipated, no cumulative effects were addressed.

20.2.1.12 Amphibians

Amphibians were assessed as a VC to determine likely interactions with specific project activities and how these interactions would affect this species group. All potential effects (habitat loss, habitat alteration, sensory disturbance, disruption of movement, direct mortality, indirect mortality, wildlife attractants and chemical hazards) arising from each project activity were identified and evaluated. After the implementation of mitigation measures, three project-related residual effects and three residual cumulative effects were determined for amphibians, in combination with other past, present, and future projects and activities occurring within the region.

The loss of suitable breeding habitat may result in a negative impact to various species. Two blue-listed (i.e. species of special concern) amphibians, namely the Great Basin spadefoot and western toad, are known to reside in the area, and a reduction in habitat may impact these species locally and regionally. Habitat loss is considered not significant (moderate) for this species group for project-related residual effects and is also considered not significant (minor) for residual cumulative effects. Approximately 48% of the potentially suitable breeding habitat in the LSA and 2% in the RSA will be removed.

Direct mortality of amphibians may result in decreased gene flow amongst populations, and possible decreased reproductive success for this species group. Direct mortality is considered not significant (moderate) for project-related residual effects and is also considered not significant (minor) for this species group for residual cumulative effects. Approximately 29% of the terrestrial habitat in the LSA and 5% in the RSA may be lost due to the project.

Chemical hazards have the potential to negatively affect amphibian populations, both in increasing mortality, as well as decreasing reproductive success of adults and development of tadpoles. With proper mitigation procedures, chemical hazards are considered not significant (minor) for both project-related effects as well as residual cumulative effects on amphibians.

20.2.1.13 Reptiles

Reptiles were assessed as a VC to determine likely interactions with specific project activities and how these interactions would affect this species group. No observations of listed snake species were recorded in the study area. All potential effects (habitat loss, sensory disturbance, disruption of movement, direct mortality, wildlife attractants and chemical hazards) arising from each project activity were identified and evaluated. After the implementation of mitigation measures, there are no anticipated project-related residual effects for reptiles. As there are no residual effects on reptiles as a result of the project there is no contribution to cumulative effects.

20.2.1.14 Migratory Birds

Migratory birds were assessed as a VC to determine likely interactions with specific project activities, and how these interactions would affect this species group. Potential effects (habitat loss, habitat alteration, sensory disturbance, disruption of movement, direct mortality, indirect mortality, wildlife attractants and chemical hazards) arising from each project activity were identified and evaluated. After the implementation of mitigation measures, two project-related residual effects and two residual cumulative effects were determined for migratory birds, as well as in combination with other past, present, and future projects and activities occurring within the region.

Habitat loss and chemical hazards are both project-related and residual cumulative effects. The loss of suitable migratory bird habitat, particularly wetlands (for waterfowl, Great Blue Herons, and Sandhill Cranes), and grasslands (for Long-billed Curlews and Common Nighthawks) could impact populations locally, but is not expected to impact populations regionally. Project-related habitat loss was considered not significant (moderate) although some loss of wetland habitat is expected to occur during the construction phase. However, the relative amount of wetlands within the regional area lost as a result of the project is less than 0.4%. This is a not significant (minor) residual cumulative effect. After the implementation of mitigation measures, chemical hazards are expected to have a not significant (minor) residual cumulative effect on waterfowl. Only a small fraction of the population occurring in the area is anticipated to breed in areas where water quality exceeds wildlife guidelines.

20.2.1.15 Raptors

Raptors were assessed as a VC to determine likely interactions with specific project activities, and how these interactions would affect this species group. All potential effects (habitat loss, habitat alteration, sensory disturbance, disruption of movement, direct mortality, indirect mortality, wildlife attractants and chemical hazards) arising from each project activity were identified and evaluated. After the implementation of mitigation measures, two project-related residual effects and two cumulative residual effects were determined for raptors, as well as in combination with other past, present, and future projects and activities occurring within the region.

The loss of suitable Great Gray Owl, Rough-legged Hawk, Short-eared Owl, and Swainson’s Hawk habitat, and additionally, the loss of at least one known Swainson’s Hawk nest, may result in an impact to these species. As two of these species are blue-listed (i.e. species of special concern) (Roughlegged Hawk, Short-eared Owl), and one is red-listed (i.e. extirpated, endangered, or threatened species) in BC (Swainson’s Hawk), the loss of sensitive sites could impact populations both locally, and regionally. Habitat loss is considered not significant (minor) for these species for project-related residual effects as a relatively small amount of suitable forested area will be removed (< 90 ha), and the grassland habitat that will be removed is currently heavily disturbed and not highly suitable for any raptor species. Habitat loss is considered not significant (minor) for cumulative residual effects, as large, undisturbed patches of suitable habitat still exists within the region.

Although sensory disturbance near raptor nests may result in their abandonment, this effect is considered not significant (minor) for both project-related and cumulative residual effects as the effect is easily reversible in the short-term and the area is already subject to a number of anthropogenic disturbances. Also, additional nesting habitat exists throughout the region, and that habitat has very little current or anticipated disturbances.

20.2.1.16 Non-Migratory Gamebirds

Non-migratory gamebirds were assessed as a VC to determine likely interactions with specific project activities, and how these interactions would affect this species group. Potential effects (habitat loss, habitat alteration, sensory disturbance, disruption of movement, direct mortality, indirect mortality, wildlife attractants and chemical hazards) arising from each project activity were identified and evaluated. After the implementation of mitigation measures, two project-related residual effects and two residual cumulative effects were determined for non-migratory gamebirds, as well as in combination with other past, present, and future projects and activities occurring within the region.

The loss of suitable Sharp-tailed Grouse habitat, and specifically the removal of one known active lek and the effective loss of another due to sensory disturbance, may result in a negative impact to this species. As the Columbian subspecies of Sharp-tailed Grouse present in the area are blue-listed (species of special concern) in BC, the loss of sensitive sites could impact populations both locally, and regionally. Habitat loss is considered not significant (moderate) for this species for project-related residual effects, as 25% of known active lek sites in the LSA will be removed. Habitat loss is considered not significant (minor) for residual cumulative effects as suitable habitat still exists within the RSA, and that habitat has very little current or anticipated disturbances.

Although sensory disturbance at Greater Sage-grouse lek sites may result in a reduction in use of these sites, such disturbance is considered not significant (moderate) for this species for project-related residual effects as the effect is easily reversible in the short-term and a reduction in lek usage does not equate to lek abandonment. Sensory disturbance at lek sites is considered not significant (minor) for this species for residual cumulative effects as additional leks exist within the region, and that habitat has very little current or anticipated disturbances.

Although sensory disturbance at nest sites of both Sharp-tailed and Ruffed Grouse may result in a reduction of use or abandonment of these sites, this effect is considered not significant (minor) for both project-related and residual cumulative effects as the effect is easily reversible in the short-term and both species were observed across the landscape, an area already subject to a number of anthropogenic disturbances.

20.2.1.17 Mammals

Mammals were assessed as a VC to determine likely interactions with specific project activities and how these interactions would affect this species group. All potential effects (habitat loss, habitat alteration, sensory disturbance, disruption of movement, direct mortality, indirect mortality, wildlife attractants and chemical hazards) arising from each project activity were identified and evaluated. After the implementation of mitigation measures, four project-related residual effects and three cumulative residual effects were determined for mammals as a result of this project, as well as in combination with other past, present, and future projects and activities occurring within the region.

The loss of American badger habitat may result in a negative impact to this species. As badgers are red-listed (extirpated, endangered, or threatened species) in BC, the loss of suitable habitat could impact populations locally and regionally. Habitat loss is considered not significant (moderate) for this species for project-related residual effects, as about 28% of suitable habitat in the LSA will be removed. Habitat loss is considered not significant (minor) for cumulative residual effects as suitable habitat still exists within the region, and that habitat has very little current or anticipated disturbances.

The loss of bat habitat will likely have a low impact effect both locally and regionally. Habitat loss is considered not significant (minor) for bats for project-related residual effects, as an estimated 15% of identified habitat associated with bat roosting in the Local Study Area (LSA) will be removed. Limiting habitat features (hibernacula) were not identified, but these features may be present at Sugarloaf Hill, an area outside of the LSA but located in in close proximity to the project. Habitat loss was not considered for cumulative residual effects as only 0.8% of roosting habitat associations in the RSA may be removed as a result of the project.

The loss of critical deer winter range will not have a noticeable effect on deer populations in the area, either locally or regionally. Habitat loss is considered not significant (minor) for deer for project-related residual effects as between 4 and 18% of identified deer winter range in the LSA may be removed, with the majority of this limiting habitat type remaining unaltered. Habitat loss was not considered for cumulative residual effects as only 0.4% of critical deer winter range in the RSA may be removed as a result of the project.

Sensory disturbance may result in a reduction of use of digs by badgers, e.g. increased stress levels and/or decreased foraging efficiency from project-related noise. Sensory disturbance is considered not significant (minor) for this species for project-related residual effects as the effect is easily reversible in the short-term, and a reduction in habitat use does not necessarily mean the habitat will be abandoned in the long-term. Disruption of badger movement may result in increased energy expenditures and decreased reproductive success for this species. Disruption of movement is considered not significant (moderate) for project-related residual effects as fragmented habitats may decrease badger populations, but individuals may shift home ranges in response to a disturbance. Disruption of movement is considered not significant (minor) for this species for cumulative residual effects, as an abundance of unfragmented grassland habitat exists southeast of the project.

Chemical hazards resulting from access to mine contact water with elevated metals and contaminants are not expected to interact with any indicator species other than bats. Exposure to contact water may have a negative effect on various bat species through an increase of metal accumulation in their system reducing overall health. The likelihood of accessing contact water, as well as the efficacy of mitigation measures, is not well understood, however, chemical hazards for bats are anticipated to have a not significant effect within the project area. Occasional ingestion of this water may not cause any negative effects in bats, however, long-term, repeated exposure has the potential to negatively impact populations in the area. Monitoring, adaptive management and mitigation measures will reduce chemical hazards resulting in a not significant (minor) effect on bats.

20.2.2 Assessment of Potential Economic Effects

The following sections present a summary of the findings presented in the Application/EIS.

20.2.2.1 Economic Growth

During construction and operations, the project will create employment in the LSA and RSA, both directly (through direct employment) and indirectly (through expenditures on goods and services to support the project), and through induced economic effects. In total, between 1,510 and 1,850 local positions (i.e., direct, indirect, and induced) are expected to be supported by the project during the peak of the construction phase, and 933 positions during the operations phase. As the operations Phase ends and decommissioning and closure begins, there will be a reduction in employment and project expenditures and economic growth at the end of the 23-year operations phase. To mitigate the influence of this effect on workers and communities in the LSA and RSA, the project will devise a communications strategy and transition programming.

While recognizing the potential challenges that may arise upon closure of the project, substantial income benefits will be generated by the project over the construction and operations phases. This includes $1.2 billion estimated for the EIS/Application in direct salaries over the operating life of the mine, as well as $23.8 million through indirect and $38 million through induced employment. In total, the EIS/Application predicts direct, indirect and induced employment to contribute in the order of $1.8 billion through salaries paid to residents of the LSA and RSA.

20.2.2.2 Labour Force, Employment & Training

The project is expected to have positive effects on labour force, employment and training opportunities in the LSA and RSA during all phases of the project. With respect to the decrease in employment and training that will accompany the project shift from the operations phase into decommissioning and closure, the effect is expected to be not significant (moderate). There will be a substantial decrease in the number of employees required on the project, but after mitigation (through communication and transition programming) it is expected that many employees will gain opportunities elsewhere in the vicinity. The relative diversity of the LSA economy and future anticipated mining projects would also help to offset this boom-bust effect. No cumulative effects are anticipated.

20.2.2.3 Income

While the project will largely have positive effects on income generation in the LSA and RSA, as the 23-year operations phase ends and the project begins decommissioning and closure, there will be a loss of income-generating jobs. To mitigate the influence of this effect on workers and communities in the LSA and RSA, the project will devise a communications strategy and transition programming. The communications strategy will involve direct employees of the project and contractors, both of which will be informed of upcoming changes in employment or business contracts in a manner that will allow them to find other employment and/or clients. The transition programming will provide support for education and training and career development. Where feasible, re-assignment will be considered. Following mitigation, the effect is conservatively expected to be not significant (moderate). No cumulative effects are anticipated.

20.2.2.4 Business

The project is expected to provide a large number of opportunities for businesses within the LSA and RSA, including Aboriginal businesses. For the purposes of developing the Application/EIS it was assumed that the project construction phase expenditures would be $1.54 CDN billion and the project operations phase expenditures would be $299 CDN million per year (on average), or $6.9 billion, over the 23-year life of the mine. The deviation of these values from those presented in this Technical Study are not considered material to the determination of potential economic effects and benefits arising from the project.

Given the project's proximity to Kamloops and the scope of business currently engaged in the mining industry both directly and indirectly, it is expected that a large proportion of project contracting needs will be addressed by local or regional businesses. Based on the estimates used for the purpose of the environmental assessment, during the operation phase, average annual local expenditures of between $75 and $105 million could occur in the Kamloops area alone.

The large workforce requirements during the construction and operation phases will provide opportunities for a broad range of occupations. It is expected that much of the anticipated workforce will be supplied from within the LSA and RSA. Some small to medium-sized business may experience challenges associated with labour competition as a result of the project. These pressures currently exist in the local mining supply and service industry and most businesses will be adept in handling them. However, KAM proposes to proactively engage industry through a Community Liaison Group to identify and mitigate potential concerns related to labour competition. The residual effect is expected to be not significant (minor).

There exists the potential for cumulative interactions related to increased labour competition and construction activities as a result of the proposed Harper Creek mine and the Kinder Morgan Canada's proposed Trans Mountain Expansion Projects (TMEP) in the same greater region. Construction activities for these projects could potentially take place during the same period as the project and it is likely that the operation phase will overlap that of Harper Creek. Industry engagement is identified as a tool to help offset potential challenges related to increased labour competition. This residual cumulative effect is expected to be not significant (minor).

20.2.2.5 Property Values

Stakeholders have expressed concern about a wide range of topics related to the project and the potential for effects on residential and agricultural property values is recognized as one. Mitigation measures recommended for air quality, noise and vibration, and visual impacts and aesthetic features will minimize potential project effects on residential and agricultural properties. Some effects, such as noise, may be perceptible for rural properties located near the perimeter of the mine site, but the effects of the project are not expected to be noticeable from Aberdeen or other residential neighborhoods, and the mine site will not be visible from these neighborhoods. However, even in the absence of measurable effects, the perception of environmental changes, or concern about the effects of the project, could also influence property values. In addition to best management practices to minimize environmental effects, KAM will share the results of environmental monitoring programs and continue engagement with the community to ensure that concerns are proactively identified and addressed.

As property values are influenced by a wide range of external factors, predicting future changes as the result of an individual project (which could have both positive and negative influences) is subject to interpretation. The Application/EIS provides a conservative (worst-case), albeit qualitative, assessment of potential changes to residential and agricultural property values. During the construction and operation phases, the project activities are expected to have a not significant (moderate) effect on perceived changes in residential and agricultural property values. However, with the implementation of project design and best management practices for air quality, noise and vibration, visual impacts and aesthetic features, and by applying adaptive management, the cumulative effect is regarded as not significant (moderate).

20.2.2.6 Economic Diversification

The project is expected to positively contribute to economic diversification in both the LSA and RSA throughout the project's life. In total, based on estimates used at the time of developing the Application/EIS between 1,510 and 1,850 total local positions (i.e., direct, indirect, and induced) are expected to be supported by the project during the peak of the construction phase, and 933 total positions during the operation phase. The deviation of these values from those presented in this Technical Study are not considered material to the determination of potential economic effects and benefits arising from the project.

As the project transitions into the decommissioning and closure phase, employment and project-related expenditures will be substantially reduced. Although this will result in much reduced project-related spending, it will not reduce goods and services expenditures and contracting opportunities below existing conditions. The project is expected to interact with economic diversification throughout the life of the mine and these interactions are expected to be negligible to minor in nature and positive. As such, the project is not expected to produce any residual adverse economic diversification effects.

20.2.3 Assessment of Potential Social Effects: Summaries & Conclusions

The following sections present a summary of the findings presented in the Application/EIS.

20.2.3.1 Infrastructure, Public Facilities and Services

There are five adverse residual effects identified for infrastructure, public facilities and services, namely: Construction-phase project workforce during peak construction increasing hotel/motel occupancy rates and constraining tourism; contractor demand for accommodations during peak construction may surpass supply of hotel/motel rooms and rental accommodations; non-local construction workforce may engage in illegal activities and increase demand on the RCMP; project traffic may affect flow of traffic through the area; and Kamloops and the TNRD may need to defer larger projects due to inadequate labour supply. The application of mitigation measures is expected to prevent these adverse residual effects and all have been determined as not significant (minor to moderate). These residual effects were carried through to the cumulative effects assessment and those that overlap with other projects were found to be not significant (minor to moderate), with implementation of mitigation measures.

20.2.3.2 Dark Sky

During the construction and operation phases, lighting will have an effect in the areas surrounding the project. Glare (sharp nuisance light in contrast to surroundings) and spill light (falling outside area needing to be lit) will peak during the construction phase when the construction activities will be most extensive. Appropriate planning, shielding and directing the light will be very effective measures to mitigate the effect and result in it being not significant (minor). However, sky glow (nighttime atmospheric dome of light seen from a distance) is expected to extend further beyond the project boundaries. Mitigation in the form of illumination management and spectral control will limit the effects but will not eliminate them. The resulting effect will lead to a not significant (moderate) effect. Given the same mitigation measures recommended for project-related lighting, the concluding effect from the combined project will result in a not significant (moderate) effect.

20.2.3.3 Visual Impact & Aesthetic Features

Visual impact and aesthetic features were considered as a VC as part of the assessment of the effects of project activities. Two potential effects on the surrounding landscape arising from the project, visual quality and shading, were identified and evaluated using on-site photographs, quantitative analyses and visual simulations. After considering mitigation strategies, it was determined that the project would result in a residual effect, wherein the visual quality of the landscape would be reduced. The effect is predicted to be not significant (moderate) for the operations phase and not significant (minor) for the post-closure phase. The residual effect was carried forward into a cumulative assessment, wherein the effect of the project on visual quality was examined in the context of activities in the surrounding area. The residual cumulative effect is predicted to be not significant (moderate).

20.2.3.4 Land and Resource Use

The presence of the project may limit the ability of the City of Kamloops and the TNRD to meet the objectives of their various land use planning initiatives. However, mitigation measures in the form of design changes to the project location, use of formal processes to amend land designations, and ongoing engagement between KAM and the City of Kamloops and the TNRD to discuss potential areas of interaction between the project and their planning, are expected to result in land and resource use effects being not significant (moderate). The potential for cumulative interactions between land use planning and the various other projects or activities in the area was assessed. With the exception of the Kinder Morgan Canada's Trans Mountain Pipeline, these all occurred within existing land use planning frameworks. KAM will continue to manage land use and activities around the construction of the Kinder Morgan Canada's Trans Mountain Pipeline. Potential effects on the City of Kamloops' and TNRD's ability to meet the objectives of various land use planning initiatives is expected to be not significant (moderate). The project, in conjunction with other project and activities active or being developed within the region, is not expected to result in cumulative effects.

20.2.3.5 Current Use of Land & Resources for Traditional Purposes

Considering the mitigation measures that will be implemented to manage access, avoid or reduce effects on harvested species, control noise and dust emissions, and otherwise reduce potential effects on fishing, hunting, gathering, and ceremonial/cultural activities, the residual effects of the project to the SSN traditional use are expected to be not significant (minor) for fishing, and not significant (moderate) for hunting, gathering, and ceremonial activities. In relation to other Aboriginal Groups, potential effects on the fishing, hunting and gathering activities of the LNIB, WP/CIB, and MNBC are expected to be not significant (minor); while effects on the AIB are expected to be not significant (negligible) as AIB representatives have indicated that current use of the local study area is limited. Potentially affected ceremonial sites or activities have not been identified for the LNIB, AIB, WP/CIB, or MNBC.

Cumulative effects are expected, and are largely related to the significant effects of past and present activities—including decades of ranching, mining, and private property—on Aboriginal peoples' ability to pursue traditional practices in the Peterson Creek watershed (RSA). Residual cumulative effects are assessed to be significant for hunting, gathering, and SSN ceremonial sites, and not significant (moderate) for fishing. However, considering these effects and the influence of past and present developments, the project represents a minor contribution to the cumulative effects that are already present.

20.2.3.6 Outdoor Recreation

The presence of the project will remove certain areas and landscape features from public use and restrict access to other areas (temporarily or permanently) for safety or operational reasons. These changes may affect the ability of individuals to access certain sites and engage in outdoor recreational activities. The effect will be managed by the implementation of an Access Management Plan, which will address overall access to the site and have the primary objective of maintaining public safety and worker safety, while allowing for continued use and enjoyment of areas in proximity to the project. Changes in access for recreational opportunities, a diminished outdoor recreation experience, and reduced availability of natural resources will be mitigated by the Access Management Plan and appropriate project design and best management practices. Their effects are regarded as not significant (moderate, moderate and minor respectively), and cumulative effects are not anticipated.

20.2.4 Assessment of Potential Heritage Effects: Summaries & Conclusions

The following sections present a summary of the findings presented in the Application/EIS.

20.2.4.1 Archaeological Sites

Project effects on known archaeological sites and as-yet unknown archaeological sites may occur during construction due to movement, excavation, or disturbance of soil, and clearing and grubbing of vegetation (direct effects). Twenty-five of the archaeological sites that will be directly affected by the project are lithic scatters or single lithic finds with a low overall significance rating. During the operation, decommissioning and closure, and post closure phases, there is a potential for effects to archaeological sites due to increased human presence (indirect effects). There are 18 known archaeological sites within the LSA where indirect effects could occur.

Archaeological sites with a higher significance include a lithic scatter that includes a Shusswap Horizon point with a moderate significance, a hunting blind complex with a significance rating of moderate-high; the location where the St. Peter’s Anglican Church and cemetery was situated with a significance rating of high, and a modified ungulate tooth with a significance rating of moderate.

While avoidance is always preferred, KAM will work with the Archaeology Branch and Aboriginal Groups to determine mitigation measures for the 28 archaeological sites located in, or within 50 metres of, project developments, where avoidance is not feasible. The aim will be to reduce residual effects to not significant (minor). It is anticipated that mitigation measures at these sites may include systematic data recovery or preservation through site capping. Additional mitigation measures and residual effects are anticipated at the Hunting Blind Complex and the St. Peter’s Church location due to significance ratings at these two sites. The Hunting Blind Complex is within the mine pit, so avoidance is not feasible. A final mitigation strategy for this site will be determined through discussion between KAM, SSN, and the Archaeology Branch.

Mitigation measures for the former site of St. Peter's Anglican Church will be determined in consultation with the Archaeology Branch, the Anglican Church, and potentially other affected stakeholders (e.g., next of kin).

Any revisions to the project footprint will be reviewed by a qualified professional archaeologist. The Chance Find Procedure will be used to provide a framework for avoiding or mitigating effects to archaeological sites, if present, that were not identified during previous studies. Mine employees and contractors will be educated about the Chance Find Procedure. Where avoidance is not possible, alterations to archaeological sites protected under the HCA (1996) will require a permit from the Archaeology Branch, and potentially additional mitigation measures determined in consultation with local First Nations and the Archaeology Branch.

Based on the mitigation measures provided above the project's effects will be reduced to not significant.

20.2.4.2 Aboriginal & Non-Aboriginal Heritage Sites

Potential effects of the project on known protected heritage resources will be managed through site avoidance or mitigation measures determined through consultation with the Archaeology Branch, Aboriginal Groups, and the local community. If heritage sites are determined to be protected under the Heritage Conservation Act then the prescribed mitigation measures will be applied. With the application of mitigation and management measures prior to project impacts, residual effects on known heritage resources are not anticipated and as a result will be not significant. Similarly, implementation of the project's Archaeology and Heritage Management Plan and Chance Find Procedure will facilitate the protection of any as-yet unknown heritage resources within the LSA, which may be identified during construction. Therefore, as-yet undiscovered heritage resources will be avoided and/or properly mitigated and managed, and residual effects are not anticipated. Once mitigation and management measures have been implemented, potential residual effects on Aboriginal and non-aboriginal heritage resources will be reduced to not significant (minor). Cumulative effects to protected heritage sites are not anticipated.

20.2.5 Assessment of Potential Health Effects: Summaries & Conclusions

The following sections present a summary of the findings presented in the Application/EIS.

20.2.5.1 Air Quality

Air quality was assessed by determining the change in ground-level concentrations of criteria air contaminants, after establishing the baseline, selecting modelling scenarios, applying the modelling, calculating air emissions inventories, cross checking and confirming the dispersion modelling results, and determining the significance of project-related and cumulative effects of ground-level concentrations of criteria air contaminants. Model inputs were selected for the purposes of the Application/EIS that were considered to result in conservative outputs relative to the likely interaction between the project and the environment.

The calculated-change in ground level concentrations due to project construction and operation phase emissions were evaluated after mitigation measures were incorporated; the resulting effect was characterized as not significant (moderate). The cumulative air quality effects assessment for future projects was completed and it was determined that there were no project interactions with approved, announced or foreseeable future projects. The assessed residual cumulative effect on the criteria air contaminants concentrations for the construction and operations phases of the project was considered not significant (moderate).

20.2.5.2 Domestic Water Quality

The assessment of domestic water quality indicates that there is no potential for the project to influence municipal water supplies to residents in the City of Kamloops and the Kamloops Indian

Reserve. When considering surface and groundwater quality in the Peterson Creek watershed that Knutsford residents may access for human drinking water and other domestic purposes, the assessment indicates that future water quality is below the applicable health-based guidelines. Some aesthetic guidelines were exceeded, which influences the taste of the water and the potential for water to stain laundry and plumbing fixtures. However, these effects are already present under existing baseline conditions.

When applying surface and groundwater from the Peterson Creek watershed for agricultural use, the assessment indicates that future water quality is above the applicable manganese guidelines for irrigation water, which may affect crop productivity in acidic soils. Plants are more tolerant of high manganese concentrations in neutral soils. For livestock water, sulphate concentrations are above the guideline, although the concentrations may also be above the guideline during low flow periods in the existing baseline situation. Higher concentrations of sulphate can be tolerated, but may result in a loss of productivity as high doses of sulphate may lead to deficiencies of essential trace elements in livestock. Proposed mitigation measures are considered effective in reducing the potential for changes to the surface water quality in the surrounding lakes, streams and rivers. For the cumulative effects assessment, there were no interactions between residual effects from the project and other nearby projects and activities.

20.2.5.3 Country Foods

Exposure to trace metals through the consumption of country foods represents one component of the overall exposure to trace metals from the project. Increases in trace metals tissue concentrations between baseline and future conditions are noted for mule deer, snowshoe hare, ruffed grouse, and domestic cattle. Increases in trace metal tissue concentrations are also noted for rainbow trout. For traditional plants and backyard garden produce, increases in trace metal concentrations between baseline and future conditions are smaller than those noted for animal and fish tissue and reflect the very small increases in metal concentrations in soil associated with the project.

Baseline and future trace metal tissue concentrations are used in conjunction with estimated metal concentrations in other environmental media (e.g., drinking water) to estimate human exposures to trace metals from multiple sources for baseline and future conditions. The potential human health risks associated with exposures to trace metals from multiple sources was evaluated by undertaking a human health effects assessment. There are no expected residual cumulative effects on country food quality.

20.2.5.4 Human Health

Residual effects from the project on human health were determined through completion of a human health effects assessment to be not significant (minor). Project activities will result in negligible changes in air quality and in the levels of metals in the terrestrial environment (i.e., soil, vegetation, and terrestrial country foods). Project activities may result in some localized changes to water quality; however, with the mitigation measures in place and the requirement to meet regulatory standards and/or site specific water quality benchmarks, changes to human health beyond what would already exist under baseline conditions would be negligible. As changes to air quality and water quality are expected to be not significant, changes to human health are also concluded to be not significant. There is no spatial or temporal overlap with other projects or activities so there are no cumulative effects. Therefore, an evaluation of significance of human health residual cumulative effects is not required.

20.2.5.5 Noise & Vibration

Noise models were completed to quantify the noise effects. Using conservative assumptions for model inputs, noise effects from the construction and operations phases of the project are predicted to comply with the BC OGC noise guideline, WHO and Health Canada noise guidance. The only exception is in the area near the east end of Jacko Lake where noise effects from the daytime piling activities (less than two months) for the proposed dam construction is higher than the annoyance threshold recommended by Health Canada. Residual effects will be reversible after the closure and reclamation phase. The significance of project noise residual effects is expected to be not significant (minor). The cumulative noise effect assessment of other non-project activities were captured in the baseline studies, which was considered in the assessment of project residual effects. Therefore, the significance of change in cumulative noise residual effects is expected to be not significant (minor) during the construction and operation phases. The noise effects during the closure and reclamation phase is expected to be lower than that for the construction phase.

The vibration effects at all receptors are below the structural damage limits established by the Ontario Ministry of Environment and Climate Change, an aquatic life vibration guideline, and the City of Toronto. Blast vibration effects during the construction and operation phases will be perceptible for some receptors. The significance of the project vibration effect is expected to be not significant (minor) during the construction and operation phases. No cumulative vibration effects interaction is expected from other non-project activities. The vibration effect during the closure and reclamation phases is expected to be lower than that for the construction phase.

20.2.5.6 Healthy Living & Health Education

During the construction and operation phases of the project, there are expected to be reduced opportunities for engaging physical activities in the LSA. The reduced opportunities result from a variety of factors, such as changes to access, changes to quality of experience, and changes to resources. Mitigation measures for other VCs (e.g., air quality, noise and vibration, fish and fish habitat) are expected to reduce project effects on the sites in the LSA where physical activity occurs, including Jacko Lake, Inks Lake, Edith Lake, and Coal Hill. In addition to minimizing project effects for VCs that support the assessment on healthy living and health education, KAM commits to developing and implementing an Access Management Plan. This plan will implement safe and feasible methods for accessing the site for a variety of stakeholders (e.g., ranchers, Aboriginal groups, recreationalists). KAM also commits to supporting the development and/or enhancement of alternative sites where physical activity may occur, e.g. recreation sites such as Inks Lake. Efforts in connection with this will be developed in consultation with government representatives and representatives from recreational groups. KAM's approach to healthy living and health education for its workers will reinforce a culture of safety during all project phases, with a goal of Zero Harm, and include a commitment to continual improvements related to health and safety performance. The mitigation measures in connection with the healthy living and health education VC are expected to result in no residual effects; therefore, the residual effect of decreased opportunities for physical activity is not carried forward to the determination of significance or cumulative effects.

20.2.5.7 Community Health & Well-being

The residual effects on community health and well-being were subjected to an assessment of their significance. Residual effects related to increased traffic and potential for increased accidents and injuries are expected to be not significant (minor). Residual effects related to the concern that the project workforce may stress the provision of community services are expected to be non-significant (moderate). Effects related to community image caused by concern that the project will contribute to an industrial image of Kamloops and not a new vision of other economic activities based on sound environmental quality is expected to be not-significant (moderate) effect.

All residual effects other than concerns about community image have been carried forward into the cumulative effects assessment to be examined together with other activities surrounding the project. The cumulative residual effect after mitigation results in a not significant (minor) effect for increased traffic, and a not significant (moderate) effect for concerns related to non-local workforce interactions.

20.3 Waste & Tailing Disposal, Site Monitoring, & Water Management

20.3.1 Tailings, Waste & Water Management

The principal design objectives for the design and management of the TSF, waste facilities, and site water management from an environmental perspective is to ensure protection of the regional groundwater and surface waters during operations and post closure, and to achieve effective reclamation at mine closure.

20.3.1.1 Geochemistry of Mine Rock & Tailings

The mineralization in the project area is associated with structural corridors of highly fractured sections of Sugarloaf and Sugarloaf Hybrid phases of the Iron Mask batholith. Chalcopyrite is the dominant copper mineral and occurs as veins, veinlets, fracture fillings, disseminations, and isolated blebs in the host rock. Concentrations of chalcopyrite rarely exceed 5%. Accessory sulphide minerals include pyrite and molybdenite. Bornite and tetrahedrite have also been observed in trace amounts.

Extensive testing and analysis has been conducted on the deposit and surrounding mine rock. In general, mine rock is expected to be predominantly non-potentially acid generating and low in metals content. Mine rock is characterized by relatively low sulphur content and high neutralization potential (NP), resulting in approximately 88% of the material being classified as not potentially acid generating (NPAG) based on a carbonate net potential ratio (CaNPR) screening value of 2.0. Similar ML/ARD characteristics are found within mineralized material except that there is an increase in copper sulphide minerals. On average, ore samples have increasing sulphide and carbonate content with increasing ore grade; however, total sulphur content is generally below 0.6%. Approximately 30% of the low and medium grade ore material was determined to be potentially acid-generating (PAG) using the CaNPR screening criteria. This relatively low percentage, with the presence of carbonate mineral in all the samples, suggests that net acid generation from the ore stockpile is not expected. Tailings are expected to have low average sulphur content and are expected to be NPAG.

Metal leaching rates, derived from kinetic tests, are relatively low and similar between mine rock lithologies. The elements cadmium, copper, nickel, zinc, arsenic, molybdenum, selenium, vanadium are considered parameters of concern (POCs) based on leachate concentration from humidity cells and field barrels.

Tailings kinetic tests indicate that tailings are not expected to generate acid rock drainage. Possible POCs for tailings are molybdenum, copper, selenium and vanadium as characterized by testing with selenium and sulphate exceed BC water quality guidelines in testing. These parameters were included in the site the water quality predictions, and resulted in minimal exceedances of site specific Water Quality Benchmarks in receiving waterbodies with the exception of locations where the benchmarks are typically exceeded under baseline conditions.

20.3.1.2 Tailings Management Overview

The principal environmental objectives for the design of the TSF are to provide containment for tailings solids and supernatant water during the operation phase, optimize supernatant management for reuse in the process plant, and tailings solids containment in the long term (post-closure) to achieve effective reclamation at mine closure.

The following factors have been considered in the design of the TSF:

- Application of Best Available Technology (BAT) and Best Available Practices (BAP) for tailings containment to ensure permanent, secure, and total containment of all tailings materials
- Control of seepage through the basin and embankments and removal of free-draining liquids from the TSF during the operation phase for recycling as process water
- No surface water discharge to the environment during the operation phase of the project
- Physical and chemical characteristics of the tailings material, including ML/ARD potential, as well as the potential for liquefaction
- Hydrology and hydrogeology, including local climatic conditions and extreme weather events (including projections of increased extreme weather events as a result of global climate change)
- Foundation geology and geotechnical considerations, as well as seismic data and earthquake risk
- Availability and characteristics of construction materials
- Topography of the tailings management facility and adjacent areas.

20.3.1.3 Water Management Overview

Goals of the water management plan include preservation of water quantity and quality downstream of the project, optimization of water use, maximization of water re-use, minimizing mixing of clean and mine-contact water, managing seepage, utilizing water diversion, and eliminating uncontrolled releases.

During operations, water will be required for use as make-up water for the process plant, potable water, explosives mixing, fire protection, the truckshop, dust control, etc. Water will be obtained from a variety of fresh, contact, and recycled water sources. All water collected, recycled, or used on the project will require containment or storage in man-made structures.

Recycled water (contact water) will be used to partially make up the water consumed in the process (e.g., evaporative losses on the tailings beach and void losses within the tailings deposits). However, because the mine will operate with a water deficit, contact water will not meet the full make-up water requirement. The deficit will be made up through fresh water supply from Kamloops Lake.

20.3.2 Environmental Management & Monitoring

20.3.2.1 Environmental Management System

An Environmental Management System (EMS) is a requirement of the *Mines Act* permit for mines in BC, and must be based primarily on *Mines Act* (1996) and *Environmental Management Act* (2003) requirements. It provides the high-level framework to manage the project's environmental risks and opportunities in a comprehensive, systematic, planned and documented manner. This framework includes the organizational structure, planning and resources for developing, implementing and maintaining minimum environmental performance and compliance expectations for the project. The EMS is the overall framework within which EMPs and other environmental programs are developed, implemented, and maintained during construction, operation, decommissioning and closure and post-closure stages of the project.

The project is committed to developing, implementing, and maintaining its EMS and continually improving environmental performance in accordance with industry recognized standards at each stage of the mining lifecycle. The project's EMS is developed in alignment with the internationally recognized ISO 14001 standard for environmental management systems and the Mining Association of Canada Towards Sustainable Mining requirements.

The EMS functions as a series of standards that outline the minimum expectations and interrelated processes to effectively control environmental risks and opportunities. These standards and their associated detailed plans, programs and procedures provide the documented framework that supports consistent integration of the EMS into the project. The basis for the environmental management framework is founded on the concept of Plan, Do, Check, and Act (PDCA). The PDCA model is an iterative process used to achieve continual improvement in process and performance. Each of the PDCA components is described below:

- **Plan:** Establish objectives and processes necessary to deliver results in accordance with the KGHM International Environmental Policy
- **Do:** Implement the EMS processes
- **Check:** Monitor and measure processes against the Environmental Policy, objectives, compliance obligations, and operational controls, and report the results
- **Act:** Take actions to continually improve.

The EMS guides environmental management across the entire lifecycle of the project and is progressively developed as the project moves through the Application/EIS, permitting, construction, operation, closure and post-closure phases. The first stage of EMS development begins with preparation of the Environmental Management Plans (EMPs) as part of the Application/EIS. The EMPs are commitment-based and broad in their level of detail. As the project progresses to the permitting stage, the level of detail of the EMPs are expanded upon as more project details are known. For the construction phase of the project, the EMPs form the basis for what will be managed as part of the Construction Environmental Management Plan (CEMP) and are organized using the systematic PDCA model. This same PDCA model is used to manage environmental risks and opportunities during the operations, closure and post-closure phases of the project.

The EMS provides the framework, including minimum standards and management processes to manage and monitor potential environmental effects. The scope of the EMS is informed by the needs of interested parties and internal and external risks and considerations that have the potential to affect the project.

The major components defined by the EMS include:

- Policy
- Leadership and Commitment
- Roles, Responsibilities and Authorities
- Environmental Risks and Opportunities
- Compliance Obligations
- Environmental Objectives and Plans
- Competency and Training
- Communication
- Operational Planning and Control
- Emergency Preparedness and Response
- Monitoring, Measurement and Performance Evaluation
- Continual Improvement.

20.3.2.2 Environmental Management & Monitoring Plans

The project's management and monitoring plans, collectively referred to as Environmental Management Plans (EMPs), make up a fundamental component of the EMS that detail environmental conservation and protection measures to mitigate potential environmental effects. The EMPs describe the environmental practices and procedures to be applied during the planning, construction, operation, closure and post-closure phases of the project. Additionally, the Ajax Project Application Information Requirements / Environmental Impact Statement Guidelines approved by the British Columbia Environmental Assessment Office (BC EAO; 2015), indicates EMPs are a key part of the EMS.

The EMPs are managed collectively under the umbrella of the EMS and its defined management processes. Individual EMPs describe management activities that are aligned with the PDCA model of the EMS, including guidance on addressing risks, identifying objectives, implementing processes and procedures, monitoring and measurement activities. As a condition of membership with the Mining Association of Canada, KAM is required to meet the requirements of the Towards Sustainable Mining protocols and frameworks. The requirements of the following Towards Sustainable Mining protocols and frameworks will be integrated into relevant EMPs:

- Aboriginal and Community Outreach
- Energy and GHG Emissions Management
- Tailings Management
- Biodiversity Conservation Management

- Safety and Health
- Crisis Management
- Mine Closure.

The monitoring and management plans included in the Application/EIS are listed below, according to the following categories:

- Operational Management and Monitoring Plans:
  - Erosion and Sediment Control Plan
  - Soil Salvage and Handling Plan
  - Construction Waste Management Plan
  - Metal Leaching and Acid Rock Drainage Management Plan
  - Air Quality Monitoring and Dust Control Plan
  - Water Management and Hydrometric Monitoring Plan
  - Contaminated Sites Management Plan
  - Solid Waste Management Plan
  - Hazardous Waste Management Plan (including liquid effluent disposal)
  - Explosives Management Plan
  - Risk Management Plan (Accidents and Malfunctions; including potential effects on the Kinder Morgan Canada's Trans Mountain Pipeline)
  - Natural Hazards Management Plan (e.g., landslides, floods)
  - Emergency Response Plan
  - Fire Hazard Abatement Plan
  - Spill Contingency Plan
  - Invasive Plant Management Plan
  - Archaeological Sites Management Plan
  - Dark Sky Management and Monitoring Plan
  - Transportation Management Plan
  - Access Management Plan
  - Noise Management Plan.
- Environmental Effects Monitoring Plans:
  - Surface Water Quality Management and Monitoring Plan
  - Groundwater Quality Management and Monitoring Plan.
- Biodiversity Management Plans:
  - Fisheries and Aquatic Life Monitoring Plan
  - Landscape Design and Restoration Plan
  - Wildlife and Vegetation Monitoring Plan (including metal uptake by plants)
  - Reclamation and Closure Plan.

Environmental Management Plan categories are shown in Table 20-8.

Table 20-8: Environmental Management Plan Categories

EMP Category	Description
Operational Management and Monitoring Plans	Address management and/or monitoring project environmental effects related to activities occurring within the mine site footprint.
Environmental Effects Monitoring Plans	Address management and/or monitoring project environmental effects from mine site activities that have the potential to extend effects off-site.
Biodiversity Management Plans	Address planning, management and/or monitoring activities, over the mine lifecycle, related to biodiversity conservation and protection measures necessary to achieve an appropriate end land-use objective.

Additional EMPs may be developed and implemented as necessary to adequately manage environmental risks and opportunities as they are identified during construction, operations, closure and post-closure stages of the project.

Some of the EMPs will be prepared in accordance with industry-wide standards, such as the Tailings Management Plan, which will be developed in accordance with the Mining Association of Canada guidance on Tailings Management Systems.

20.3.2.3 Compensation Plans

Mitigation measures to reduce negative effects are identified within these EMPs and monitoring will track their successful implementation or identify situations when performance objectives are not being met requiring adaptive management. However, two compensation plans are identified – fisheries offsetting plan (section 20.2.1.7) and wetland compensation program (section 20.2.1.9) – as there remains negative effects after the implementation of mitigation measures and compensation for the loss is needed. Development of compensation plans is based on technical and safety considerations, regulatory requirements and consultation feedback. Risks to the permit application submission and review schedule include delay in developing appropriate compensation plans to meet operational/safety needs, regulatory requirements and social acceptability.

20.4 Social & Community Requirements

The Ajax Project is located south of the City of Kamloops, BC, which has a population of approximately 85,000 people. Kamloops is surrounded by the smaller communities of Cherry Creek, Knutsford, Pritchard, Savona, Scotch Creek, Adams Lake, Chase, Paul Lake and Pinantan.

The project lies within the Secwépemc traditional territory. The project also lies in the Nlaka'pamux Nation traditional territory. The BC EAO Section 13 Order for the project identified the following Aboriginal groups who could potentially be affected by the project:

- Tk'emlúps te Secwépemc (TteS) and Skeetchestn Indian Band (SIB), jointly known as the Stk'emlupsemc te Secwépemc Nation (SSN). The term "First Nations" applies to the SSN according to the Section 13 order. The SSN represents the TteS and the SIB. In 2007, the two groups formed the SSN to manage negotiations, conservation and resources for the New Afton open pit mine (BC Aboriginal Business and Investment Council n.d.). The SSN aims to strengthen the economic and social conditions for its

Nation members and works to capitalize on business opportunities arising from the resource sector.

- Lower Nicola Indian Band (LNIB) located 6 km from Merritt and a part of the Nlaka'pamux Nation.
- Ashcroft Indian Band (AIB) located close to the town of Ashcroft and part of the Nlaka'pamux Nation.

The Whispering Pines/Clinton Indian Band (WP/CIB) is identified by the Section 13 order as the Notification First Nation. The WP/CIB was formerly located outside the village of Clinton on Highway 97 and is a member of the Secwépemc Nation.

KAM also continues to engage Métis Nation BC (MNBC), as directed by the CEA Agency.

Community and First Nations consultation has been initiated by KAM and will be ongoing throughout EA review and subsequent phases of the project.

20.4.1 Public Engagement

Consultation with the public and stakeholders, and government agencies and local government during the pre-Application/EIS stage has followed the direction provided in the section 11 Order ss. 4, 10, 11, 14, 16 and 17) issued by the BC Environmental Assessment Office (BC EAO, 2012) as well as Section 4.4 of the AIR/EIS Guidelines. Public and stakeholder consultation has also followed KAM's May 2012 Community Consultation Plan, which was updated in April 2015 (KAM 2015). In a letter dated October 13, 2015, the EAO expressed that it was satisfied that the consultation undertaken during the pre-Application stage of the process was adequate and met the objectives and requirements of the Community Consultation Plan and Section 11 Order.

KAM has consulted — and will continue to consult—in a manner consistent with direction provided by the BC EAO and CEA Agency and the highest standards of community engagement. KAM has adopted consultation practices and employed a variety of mechanisms to:

- Provide project information to the community of Kamloops, as well as Knutsford and other neighbouring residents, stakeholders, interest groups, land users, local governments, and provincial and federal government agencies
- Solicit comments on the project
- Provide timely responses to comments
- Assist Ajax Project development, planning and operational design

20.4.1.1 Consultation Objectives

The Proponent recognizes that long-lasting, productive relationships with communities are created through meaningful communication and consultation. The relationships that form as people engage with corporations proposing large-scale projects, such as the Ajax Project, are critical to the development of social license.

KAM is committed to open and transparent communication with Kamloops residents and other key stakeholders as it develops the Ajax Project. Effective and engaging consultation helps communities and companies learn about each other's needs and aspirations, and ultimately, reach mutually beneficial levels of understanding.

Consultation related to the project has been informed by several guidance documents, which are described below.

The Canadian Environmental Assessment Agency (CEA Agency), in consultation guidelines published in 2008 (CEAA 2008), identifies consultation and engagement principles. These principles include:

- Early notification
- Accessible information
- Shared knowledge
- Sensitivity to community values
- Appropriate levels of participation
- Adaptive processes
- Transparent results.

Further, the CEA Agency guidelines, which are based on International Association for Public Participation (CEAA 2008) practices, state:

> *"Meaningful public participation reflects the principles of accessibility, impartiality, transparency, consistency, efficiency, accountability, fairness and timeliness, and recognizes that all parties have responsibilities in meeting these principles. This is an acknowledgment that additional elements may be essential to ensure meaningful public participation. Meaningful will be defined differently by different parties and may vary on a case-by-case basis."*

The proponent is also aware of consultation principles embraced by the BC EAO (BC EAO 2011), expressed as:

> *"Public consultation during an environmental assessment (EA) contributes to the collection and sharing of information related to the potential environmental, economic, social, heritage and health effects of a proposed project. Consultation is intended to ensure that opportunities exist for the public to understand the proposed project and to have their comments appropriately considered*."

Further, KAM understands that BC EAO has recognized the following consultation objectives (BC EAO 2015):

- To ensure that people who may be affected by a project understand what environmental assessment is and have clear information about the proposed project, to help them participate in the process
- To ensure that the public consultation program and activities carried out by the EAO and proponents are well designed to listen and respond to the range of perspectives, issues and concerns of the public and stakeholders

- To gather relevant information, experience and knowledge from the public about a project's potential adverse effects on communities, and practical measures to address them
- To provide the government ministers who will make the final decision on whether to approve the project with information about the issues raised by the public, the potential effects on local populations, and how those have been responded to during the environmental assessment
- To clearly demonstrate how public input was used during the environmental assessment.

KAM has embraced the principles as outlined and implemented a comprehensive consultation, engagement and communication process designed to provide interested parties with opportunities to become informed and express their views about the project, including asking questions and seeking answers. The input provided through this process has proved valuable to KAM in the planning of proposed mine operations and mine design.

As well, the proponent has sought to establish metrics, feedback and reporting procedures to the greatest extent possible to monitor, guide and report on the effectiveness of its consultation efforts. KAM will endeavour to show alignment with the above-mentioned principles and objectives through this consultation report.

20.4.1.2 Consultation Requirements

Public consultation requirements for the British Columbia environmental assessment process are set out in the *BC Environmental Assessment Act* (2002) Public Consultation Policy Regulation (B.C. Reg. 373/2002). The regulation sets out requirements for giving public notice, providing public access to information, establishing formal public comment periods, and engaging the public. Specifically, KAM has been mandated by the section 11 Order to consult and report on its consultation efforts.

The Order indicates that KAM is required to:

- Provide public notice of key events related to development of the Ajax Project AIR/EIS Guidelines, as well as filing of the Application/EIS, open houses and public commenting periods (s. 4)
- Develop and implement an approved consultation plan (s. 10.1)
- Report on comments and responses received during public comment periods (s. 10.3)
- Consult with federal, provincial and local governments on an individual basis (s. 11.1)
- Include in its application a summary of public consultation activities and a proposal for consultation through the Application review phase (ss. 14.1.1 and 14.1.2)
- Provide a written report regarding issues and concerns identified during the Application review phase, and how the proponent intends to address them (s.16.3).

KAM understands its consultation obligations, determined by both provincial and federal processes and specified in the section 11 Order and/or AIR/EIS Guidelines, to include:

- Creation and implementation of a public consultation plan

- Notification of interested persons, including those likely to be directly affected by project activities and others that may be affected, including sufficient advance notice of public events related to official commenting periods or other events mandated by BC EAO/CEA Agency
- Provision of mechanisms for two-way communication and meaningful consultation between KAM and the public
- Identification of public perspectives, concerns and opinions about the proposed project that should be considered in the Application/EIS
- Identification of key issues and the proposed means by which the proponent will deal with issues
- Identification and assessment of potential effects on environmental, economic, social, heritage, and health conditions
- Identification of measures that could be used to avoid, mitigate or otherwise address potential concerns and effects
- Documentation of public and stakeholders interactions in section 11 Order consultation reports and in the Application/EIS.

As well, as part of the consultation process, BC EAO directed the formation of a Community Advisory Group, which was mandated to, among other things, "provide a forum for meaningful dialogue and input into the environmental assessment of the proposed Ajax Mine project." The proponent realized the value of CAG input early in the consultation process and sought to accommodate and enable productive relationships and engagement with the CAG from the outset.

The company recognized, and continues to recognize, the value and importance of meeting its obligations related to public consultation. Informing and involving the community throughout the planning, review and implementation phases of the Ajax Project is paramount to acquiring the social acceptance of the project that is needed to ensure long-lasting beneficial relationships with stakeholders and the community.

20.4.1.3 Public Consultation Plan

KAM's public consultation plan, required by the section 11 Order, was submitted to the BC EAO in May 2012 and a further update was provided in April 2015. The plans set out the scope of activities for KAM leading to the submission of its Application/EIS, through the Application/EIS review phase and beyond. As noted jointly by the BC EAO and CEA Agency, the approved version of the proponent's (May 2012) Community Consultation Plan was developed with significant input from the Community Advisory Group and the City of Kamloops.

To the greatest extent possible, commitments to consultation made in KAM's plans have been fully honoured or implemented. It is important to note that KAM has maintained a flexible, iterative approach to its consultation plans. Rather than rigid adherence to fixed schedules, the proponent has adapted as needed to changing circumstances — most specifically, changes to the Ajax Project General Arrangement (GA) announced in May 2014 —to provide the public and stakeholders best opportunities to engage with the company.

The April 2015 consultation plan update provided clarity around activities subsequent to KAM's decision to reconfigure the mine plan. As well, the update provided more detail around the proponent's intended activities after the Application/EIS submission. The consultation schedule within the April 2015 update was divided into three distinct components — a pre-Application/EIS phase (which ended May 31, 2015), an Application/EIS review phase, and a post-Application/EIS review phase. Through all consultation phases, KAM's approach and intent has been, and will continue to be, to build trusting relationships through continuous sharing of information and engagement with the public, local governments, organizations and other groups.

The proponent has adopted a multi-tiered approach to consultation, recognizing that some means of communication and consultation are good at reaching large numbers of people while others are better for personal engagement. This "macro-micro" approach recognizes that consultation methods provide different kinds of experiences for the public and stakeholders; there is not a single method sufficient to provide for the needs of all.

KAM recognizes that consultation with a diverse community such as Kamloops requires communication through varied means. KAM has, and will continue to, employ a range of consultation and information distribution methods and tools to reach larger audiences as well as individuals. These communications tools will continue to evolve to incorporate feedback from Kamloops residents and stakeholders on preferred communication approaches and ongoing 'lessons learned' review of completed consultation to identify efficient/successful methods.

20.4.1.4 Public Perceptions of the Project and the Environmental Assessment Process

The Ajax project's proximity to Kamloops and location within the traditional territories of several Aboriginal groups means heightened interest and concern over land uses such as mining. These public perceptions of the project have affected how the project has been developed to date, and may affect how the project passes through the EA process.

Public perceptions that have already affected the project, and KAM's management responses, are as follows:

- **Public concern over the project's proximity to the city boundary.** Local residents and other groups were concerned about air quality, dust, noise, water quality, and other effects to their quality of life and health. This concern prompted KAM to reconfigure the project on the southern edge of the property, away from residential areas.
- **Public concern over real and perceived effects to people and the environment.** Local residents and other groups, citing the previously mentioned concerns regarding air quality, dust, noise, water quality, and other effects, have organized into active groups to represent their position that the project is not in their interest. These groups, including the Kamloops Area Preservation Association and the Kamloops Physicians for a Healthy Environment, have been active participants in public meetings, social media discussions, and other forums where benefits and concerns regarding the project have been discussed. KAM has responded to these concerns by intensifying the public engagement and information available about the project, including adding topics to the Application/EIS.
- **Public concern that members of the public would not understand the research science that formed the basis of the Application/EIS.** This concern prompted KAM to commit to writing a summary of the Application/EIS in plain language that would be accessible to a broad variety of individuals and groups.

Public perceptions of the project that may affect the EA process and its' timelines are as follows, listed together with KAM's planned management actions:

- **the number and type of public comments** that the project may anticipate in response to the Application/EIS has the potential to be very large. Some of these comments may require detailed technical responses from the proponent. These responses may require a significant time commitment from KAM and consulting hours to develop the detailed technical information that external groups may expect. These detailed technical responses may require translation into "plain language", as with the Application/EIS.
- **continued public concern regarding the project**, translating into negative attention in traditional and social media. Negative public attention may translate into the need for more intensified engagement with the public, including open houses, site tours, and small group meetings.

If external groups continue to feel that their concerns regarding the project have not been addressed, there is a possibility that they could escalate to legal challenges to the project through the court system or procedural challenges through the EA process. Managing these legal or procedural challenges – if they materialized – could require a significant commitment of time and legal expertise.

20.4.2 Aboriginal Groups Engagement

The BC EAO formally delegated aspects of its consultation responsibilities to KAM through an Order issued under section 11 of the BC EAA on January 11, 2012. The section 11 Order identifies the project "First Nations" as the Stk'emlupsemc te Secwépemc Nation (SSN), which is comprised of the Tk'emlúps te Secwépemc (TteS) and Skeetchestn Indian Band (SIB), whom KAM is required to consult regarding potential project effects on their Aboriginal interests as well as their perspectives on the project. The section 11 Order also identifies "Working Group First Nations" comprised of the Lower Nicola Indian Band (LNIB) and Ashcroft Indian Band (AIB). The section 11 Order directs KAM to provide information to the LNIB and AIB regarding the project, specifically the Application/EIS. On July 23, 2015, the BC EAO issued the section 13 Order as an amendment to the requirements outlined in the section 11 Order, directing KAM to provide information to the WP/CIB regarding the project as a "Notification First Nation". In addition to the Aboriginal groups identified above, the CEA Agency identifies the Métis Nation British Columbia (MNBC) as potentially affected by the project. In a letter dated June 9, 2014, the CEA Agency advised KAM that it should consult Aboriginal groups at different depths as described in Table 20-9.

Table 20-9: Aboriginal Groups Consultations

Aboriginal Group	BC EAO's Section 11 & Section 13 Orders	CEA Agency Consultation Depth*
Stk'emlupsemc te Secwépemc Nation	First Nation	High
Ashcroft Indian Band	Working Group First Nation	Moderate
Lower Nicola Indian Band	Working Group First Nation	Moderate
Whispering Pines/Clinton Indian Band	Notification First Nation	Moderate
Métis Nation British Columbia	Not mentioned	Low

* Depth of consultation varies depending on seriousness of impacts and strength of claim.

Methods and tools utilized to share information and consult with Aboriginal Groups during the Pre-Application/EIS period included the following:

- **Early Notification.** KAM contacted leadership for each Aboriginal Group to notify them about the project and request introductory meetings, seek a point-of-contact and identify group-specific consultation policies, protocols or preferences.

- **Site Tours**. To support information sharing, KAM hosted site tours to the project site. The site tours are designed to introduce and familiarize Aboriginal Groups and the public with the mine site and provide more information about the project. Site tours began in the Pre-Application phase and are ongoing.
- **Meetings with Aboriginal Leadership**. KAM met with Aboriginal Group leadership to provide opportunities to provide opportunities to present information on the project, exchange information and identify the concerns and interests of Aboriginal Groups.
- **Stakeholder Issues & Information Management System**. KAM is committed to meaningful consideration of the concerns, interests, and issues of Aboriginal Groups. Information is captured in a formal information management system. The database system allows for tracking and monitoring of contact information, meeting attendance, types of meetings (e.g., community meetings, one-on-one meetings) held, date and time of contact, and detailed summaries of what was discussed. Issues are tracked in the stakeholder issues and information management system and distributed to appropriate scientific teams to ensure the information is carefully considered in the baseline studies, effects assessments, and mitigation and monitoring strategies.
- **Project Website & Blog**. In 2011, a project website and blog (www.ajaxmine.ca) were developed to facilitate information sharing and distribution. The website presents a range of information such as project facts, the management team, project history, site tours, newsletters, FAQs and answers, as well as copies of technical reports and presentations.
- **Project Office**. In July 2011, KAM opened a project office in downtown Kamloops to specifically give Aboriginal community members and the public a place where they could learn about the project, ask questions, and share their perspectives and opinions.
- **Project Materials**. KAM developed a range of materials to support project consultation, such as project fact sheets, project storyboards and displays, brochures, 3-dimensional model and multi-media tools and baseline study summaries, and shared via e-mails, letters, at community presentations, and other forums. KAM updated materials as needed to match current project status.
- **Creation of an External Affairs Team**. KAM created an External Affairs Team, including community relations specialists, a First Nations Liaison Specialist, and external affairs specialists, to facilitate information distribution and consultation.

The SSN have developed their own project assessment process that will run in parallel to the EA process providing an opportunity for a process that respects the SSN cultural perspectives, knowledge and history. The SSN summarized their assessment process in a presentation dated July 17, 2015 and consists of the following steps:

- Information Gathering. During the information gathering step, the SSN identify key people such as elders, knowledge holders, technical support and political persons to engage with. Knowledge and information may be gathered through consultation, and key person interviews considered in tandem with the Trout Children Story Sky World Contest & Marriage, KAM agreements, and consultation history and records.
- SSN Assessments. The SSN are in the process of conducting assessments which includes review of the EA Application and preparation of assessments of Aboriginal

Economies, Governance and the Trout Children Story. The Assessments team will use the Trout Children Story to assess KAM's consultation history and records. As part of this step, recommendations will be prepared for the written and oral record.

- Oral Hearing Assessment Results. This step involves a gathering where oral evidence and knowledge will be heard and written reports will also be supplied. The SSN Decision table will also sit for a hearing.
- Deliberation SSN Decision Making Table. This step is when the decision table will review information and internally deliberate on project decisions.
- SSN Project Decisions. In this step, decisions will be made based on the assessments and hearings.
- SSN Decision Package. This is when the SSN Decision Package will be prepared including individual assessments.

KAM intends to participate in the SSN Assessment Process by considering and responding to SSN's perspectives, opinions and technical information, including that which may result from the SSN Assessment Process. KAM proposes the following ways to participate in the SSN Assessment Process:

- During the Information Gathering and Preparation Phase, the SSN will provide KAM with the preliminary results of data gathering activities specifically with respect to governance, the Trout Children Story, and Aboriginal Economies. KAM will use the preliminary information provided by SSN to develop an assessment for Day 60 of the Application Review.
- Throughout the SSN Assessment Process, KAM will make the appropriate representatives available for key milestones. Should SSN require the presence of KAM's technical experts, advance notice will be required to avoid scheduling conflicts.
- As requested, KAM will participate in SSN Community Sessions such as meetings with family groups (as identified by the SSN Project Assessment Process), community meetings, sessions with knowledge holders or elders, or technical workshops. These activities will be led by the SSN Engagement Team whom will be responsible for identifying appropriate opportunities for KAM's participation.
- During the Oral Hearing Phase, KAM will (at SSN's invitation), participate in the Oral Hearing and as appropriate, make technical experts available.
- During the Oral Hearing Phase, KAM will (at SSN's invitation), participate in the Oral Hearing and as appropriate, make technical experts available.
- During the SSN Project Decisions Phase, KAM will review and provide comments and feedback on the SSN Decision Package.

20.4.2.1 Environmental Assessment Procedures

This subsection summarizes consultation conducted with Aboriginal Groups as part of the EA procedures, including notification of the project, Working Group meetings, and development of the AIR/EIS Guidelines.

20.4.2.1.1 Notification of the Project

The SSN were notified of the project in February 2006 when Abacus Mining and Exploration Corporation began early consultation efforts. After the section 10 Order was issued by BC EAO on February 25, 2011 CEA Agency also determined that the project was subject to an EA and the federal process began with a Notice of Commencement dated May 31, 2011.

KAM notified AIB and LNIB about the project through a letter provided on January 19, 2011, prior to submission of the Project Description. KAM notified WP/CIB in March 2013 and MNBC in January 2012.

20.4.2.1.2 Ajax Project EA Working Group

The SSN, AIB, and LNIB participated in a number of Working Group meetings held between 2011 and 2015, as summarized in Table 20-10. Through the Working Group, the SSN, AIB, and LNIB were provided with opportunities to review and comment (verbal and written) on the selection of VCs for the effects assessment, design of the baseline study programs, environmental and socio-economic studies, and any issues and information requirements related to the EA.

Table 20-10: Ajax Project Working Group Meetings (2011 to 2015)

Date	Topics of Discussion	Participating Aboriginal Group
EA Working Group Meetings		
April 27, 2011	• Federal and Provincial EA Processes • Project Description • Working Group Questions and Answers • First Nation Consultation Program • KAM Study Program • Preliminary Issue Identification	SSN
October 27, 2011	• Draft AIR/EIS Guidelines – Issues and Responses • Role and responsibilities of the Working Group • Working Group Issues Tracking Table • Creation of sub-working groups	SSN
June 23, 2014	• Project update • Updated General Arrangement • Draft AIR/EIS Guidelines updates • Waste rock and tailings management • Water resources (Jacko Lake and Peterson Creek) • Air quality and dust control • Public consultation	SSN AIB LNIB
July 7, 2015 - Session I	• Overview of Application • Project Description • Project Alternatives • Geochemistry • Water Quantity and Quality • Fish and Aquatics	SSN LNIB
July 8, 2015 - Session II	• Noise and Vibration • Air Quality • Human Health Ecological Risk Assessment • Social VCs • Accidents and Malfunctions	SSN LNIB

Date	Topics of Discussion	Participating Aboriginal Group
July 9, 2015 - Session I	• Terrestrial Wildlife • Soils and Reclamation • Archaeology • Part C (Aboriginal Groups Information Setting and Background; Procedural Aspects of Consultation; Aboriginal Interests (Rights and Title)	SSN LNIB
Health Sub-Working Group Meetings		
January 24, 2012	• Project update • Draft AIR/EIS Guidelines development • Air quality and dust control • Noise and vibration • Vegetation and plant communities • Health risk assessment • First Nation engagement and community relations	SSN
May 10, 2012	• Draft AIR/EIS Guidelines development • Assessment of effects on air quality and noise • Noise modelling plan • Air dispersion modelling plan	SSN
July 8, 2015	• Air Quality Model and Results • Human Health Ecological Risk Assessment • Questions and Discussion	SSN LNIB
Water Quality Sub-Working Group Meetings		
February 27, 2012	• Draft AIR/EIS Guidelines development • Overview of water quality conditions (Inks Lake, Jacko Lake) • Geochemical characterization program (waste rock and tailings) • Dust control • Further discussion on cumulative effects	SSN AIB
May 16, 2012	• Design of the TSF • Water seepage and discharge • Water flow in Inks Lake and Jacko Lake • Effluent discharge • Tailings seepage into groundwater • Kinder Morgan Canada's Trans Mountain Pipeline • Dust control • Reclamation plan	SSN
Social Sub-Working Group Meeting		
July 8, 2015	• Socio-economic Effects Assessment • Noise and Vibration Effects Assessment • Questions and Discussion	SSN LNIB
Fish & Aquatics Sub-Working Group Meeting		
July 8, 2015	• Fish Habitat Offsetting • Questions and Discussion	SSN LNIB

Comments provided were considered in the development of the VCs, the AIR/EIS Guidelines, and other aspects of the Application/EIS.

20.4.2.1.3 AIR/EIS Guidelines

BC EAO provided Aboriginal Groups with opportunities to review and comment on drafts of the AIR/EIS Guidelines. Comments received from Aboriginal Groups were considered and, where applicable, incorporated into the AIR/EIS Guidelines.

20.4.2.2 Consultation Activities

20.4.2.2.1 Stk'emlupsemc te Secwépemc Nation

Consultation activities undertaken with the SSN during the Pre-Application period include EA funding, capacity building, funding for a Cultural Heritage Study (CHS) study, community meetings, site tours, and meetings with SSN representatives.

Funding for the CHS was provided in 2012. In September 2015, KAM provided additional funding 2015 to complete an additional CHS based on the updated general arrangement of the Project. KAM also provided interim capacity funding during the preliminary phases of the EA in 2008, 2010, and 2014. A review stage capacity agreement was signed in December 2015 which will further support the SSN in developing additional primary data on land uses. It is KAM's understanding that the SSN will undertake surveys, focus groups and/or interviews with membership to obtain additional baseline information on perspectives regarding the Aboriginal economy, Governance and the Trout Children Story and how the Project could interact with these factors.

Table 20 11 presents an overview of consultation activities with SSN.

Table 20-11: Summary of Consultation Activities with SSN

Summary of Consultation	Number/Yes/No
Consultation Activities Undertaken	
Number of Recorded Meetings	65
Number of Community Meetings	4
Number of Site Tours	7
Capacity Funding	Yes
Information Sharing & Consultation	
First Nations Consultation Plan	Yes
First Nations Consultation Report	Yes
Shape Files, metadata files for drill holes, 3-D models, mineral tenures, LiDAR video	Yes
Draft AIR/EIS Guidelines	Yes
Press Releases	Yes
Archaeological Field Work	
Participated	Yes
Field Program and Permit Notification	Yes
Participated in Knowledge Studies	
Cultural Heritage Study	Yes
Preliminary Mitigation Report	Yes

First Nations Consultation Plan & Reporting. As directed in subsections 9.2 and 13.1 of the section 11 Order, KAM developed a First Nations Consultation Plan (FNCP) to guide its activities and responsibilities in the consultation process with the SSN during the Pre-Application and Application/EIS review periods. With respect to consultation preferences, meetings were held regarding SSN's preferred consultation approaches for the Pre-Application and Application review period, during which SSN identified a framework for consultation.

The FNCP aims to ensure that Aboriginal Groups are engaged in a manner that is effective and respectful of the preferred engagement and consultation approaches. KAM will continue to consult SSN throughout the Pre-Application and Application review periods and will be flexible to meet SSN consultation expectations. The FNCP:

- Describes consultation under the regulatory process (established by the BC EAO and CEA Agency)
- Identifies consultation objectives and methods, including protocols and policies, and procedures for dispute resolution
- Identifies approach to consultation documentation, including tracking of records and other correspondence
- Provides a summary of consultation activities conducted to date and planned consultation initiatives for the remaining Pre-Application period
- Describes key issues raised to date by the SSN
- Proposes future consultation activities the Application review periods.

KAM implemented, and to the extent possible, completed all consultation described in the FNCP. A draft of the FNCP was provided to the SSN for review and comments on December 9, 2014. KAM received comments from the SSN on February 2, 2015. KAM met with SSN to discuss these comments on February 4, 2015. A revised FNCP, addressing SSN comments, was provided to SSN on April 10, 2015. On May 4, 2015, the SSN and KAM exchanged further emails about how best to receive any additional comments from SSN on the FNCP. On May 20, 2015, KAM provided SSN with a track changes version of the FNCP to further facilitate their review. KAM also notified the SSN that it views the FNCP as an iterative document that can be revised with SSN input over the various project phases. On June 10, 2015, the SSN acknowledged KAM’s efforts to incorporate SSN input into the FNCP and provided additional comments. KAM tracked these comments and incorporated these comments into a final FNCP issued on June 19, 2015.

Pursuant to subsections 13.1 and 13.2 of the section 11 Order, KAM prepared a First Nation Consultation Report detailing the consultation undertaken with the SSN in relation to the project. This was provided to the SSN for comments on July 13, 2015. In previous correspondence, SSN requested to review copies of the SSN Issues Tracking Table and the Summary of Communication. Versions of the Summary of Communication with Aboriginal Groups and Aboriginal Groups Issues Tracking Tables were also provided with information only related to the SSN on July 13, 2015. At the time of writing, no comments were received from SSN on these documents, including the First Nation Consultation Report.

In a letter dated November 20, 2015, the EAO expressed that it was satisfied that the basic procedural requirements of the Section 11 Order had been met for the pre-Application stage of the EA process. The EAO provided further direction on requirements going forward into detailed review of the Application/EIS, including submission of an updated FNCP. At the time of writing, KAM was working to develop an updated FNCP to address EAO requirements.

20.4.2.2.2 Ashcroft Indian Band & Lower Nicola Indian Band

Consultation activities undertaken with the AIB and LNIB during the Pre-Application/EIS period includes EA funding, capacity building, meetings, site tours, and information sharing, summarized in Table 20-12.

20.4.2.2.3 Whispering Pines/Clinton Indian Band

Activities undertaken with WP/CIB during the Pre-Application/EIS period include EA funding, meetings, site tours, and information sharing, summarized in Table 20-13.

Table 20-12: Summary of Consultation Activities with AIB & LNB

Consultation Activity	Description of Consultation	
	Ashcroft Indian Band	**Lower Nicola Indian Band**
Environmental Assessment Funding	AIB has noted they are in full support of the project and wrote a letter to this effect to the BC EAO, CEA Agency, BC MARR, and BC MFLNRO on October 24, 2014. Consultation and Benefits Agreement also endorsed on October 24, 2014.	LNIB signed an agreement with KAM in July 2015 providing funding to facilitate community meetings and engagement with LNIB throughout the Pre-Application/EIS and Application/EIS review stages of the project.
Information Sharing	Expressed an interest in capacity-building through employment, training, and economic opportunities. KAM agreed to share information on these topics with AIB as it becomes available.	Expressed interest in capacity-building through employment, training, and economic opportunities. KAM continues to share information on employment, procurement and training opportunities as it becomes available.
Meetings	Met five times during the Pre-Application period.	Met eight times during the Pre-Application period.
Site Tours	Attended BC EAO Working Group site tour on June 23, 2014.	Attended site tour on January 19, 2015.
Information Sharing	Ongoing written communications between AIB and KAM via letters and e-mails. KAM shared copies of the draft socio-economic baseline (only information pertaining to AIB) and sections of the Application/EIS (in Chapters 12 to 14) as well as Section 8.5 (Current Use of Lands and Resources for Traditional Purposes) KAM requested AIB provide feedback on these sections but at the time of writing, no comments were received.	Ongoing written communications between LNIB and KAM via letters and e-mails. KAM also sought feedback on the socio-economic baseline (only information pertaining to LNIB) and sections of the Application/EIS (in Chapters 12 to 14) as well as Section 8.5 (Current Use of Lands and Resources for Traditional Purposes) KAM requested LNIB provide feedback on these sections but at the time of writing, no comments were received.

Table 20-13: Summary of Consultation Activities with WP/CIB

Consultation Activity	Description of Consultation with WP/CIB
Environmental Assessment Funding	Capacity Funding Agreement signed in May 2015.
Meetings	Three in-person meetings during Pre-Application period.
Site Tours	KAM offered to provide site tour for WP/CIB with no response received to date.
Information Sharing	On-going written communications between WP/CIB and KAM via letters and e-mails. KAM also sought feedback on the socio-economic baseline (only information pertaining to WP/CIB) and sections of the Application/EIS (in Chapters 12 to 14).

20.4.2.2.4 Métis Nation British Columbia

Activities undertaken with MNBC during the Pre-Application/EIS period include EA funding, meetings, site tours, and information sharing, summarized in Table 20-14.

Table 20-14: Summary of Consultation Activities with MNBC

Consultation Activity	Description of Consultation with MNBC
Environmental Assessment Funding	KAM developed an information sharing agreement providing funding for community meetings, a review of MNBC's harvester database, one-on-one data gathering activities. MNBC provided the "MNBC-KGHM/Ajax Mine Initial Project Report, January 2015", summarizing land use information and included comments and concerns regarding the project, Métis harvesting philosophy, harvesting data, and estimates of Harvester Card holders. MNBC also provided "MNBC Working on Behalf of Métis People in BC" and "MNBC-KGHM/Ajax Mine Socio-economic Report – March 2015", containing socio-economic information.
Information Sharing	Expressed interest in capacity-building through employment, training, and economic opportunities. Provided KAM with Industry Protocol and KAM shared preliminary employment, procurement and training opportunities with MNBC.
Meetings and Community Meetings	KAM participated in three community meetings in November held in Kamloops, Merritt, and Ashcroft. Three in-person meetings and several teleconference discussions during the Pre-Application period.
Site Tours	KAM offered to provide site tour for MNBC with no response received to date.
Information Sharing	On-going written communications between MNBC and KAM via letters and e-mails. KAM also sought feedback on the socio-economic baseline (only information pertaining to MNBC) and sections of the Application/EIS (in Chapters 12 to 14).

20.4.2.3 Aboriginal Groups' Perceptions of the Project and the Environmental Assessment Process

KAM has been actively consulting Aboriginal groups under the EA process, as well as conducting dialogue with a view toward reaching an agreement that considers impacts to Aboriginal rights of, and provides benefits to, the SSN (project agreement). Through these two processes, which has included providing funding to SSN to conduct Cultural Heritage Studies, KAM has come to understand that the SSN has concerns about the location of the project relative to an area they call Pípsell, which is composed of Jacko Lake and surrounding area. The SSN has informed KAM that this area has spiritual, cultural, and historical importance to them; the SSN has cited effects of historic mining activity on this area as the reason why they are concerned about the Ajax project. In June of 2015, the SSN declared Aboriginal title over

Pípsell. If the courts find that the SSN's claim has merit, there are potential implications for the SSN's ability to allow or deny mining to take place in this area. It is not immediately clear when a legal decision will be reached. It is also not immediately clear whether SSN would intend to block mining if its title is recognized.

The SSN claim to Aboriginal title over Pípsell underscores the need for KAM to reach a negotiated agreement with SSN that provides assurance to both parties that the project is welcomed and mutually beneficial. The financial analysis for the project presented in section 21 includes an annual cost associated with a negotiated agreement calculated in terms of a net smelter royalty. This magnitude of this cost has been informed by the negotiations completed to date with the SSN and by benchmarking with other projects in BC and Canada. The cost of delays or changes to project design (such as a reduction in pit limits to avoid impacts to Jacko Lake) has not been incorporated into the financial analysis presented in this technical report.

20.5 Mine Closure

This section outlines the preliminary closure plan developed to support the Application/EIS and associated cost estimate based on third party implementation and completion of the closure plan measures. This cost estimate is the basis of negotiations with the BC government for bonding requirements and will be refined with ongoing project design and planning. For the purpose of this feasibility update, closure costs, based on owner-completion of closure and reclamation, have been incorporated in the project cash flow analysis.

Under existing *Mines Act* permit M-112 - Reclamation Permit issued originally in 1999, KAM assumes all reclamation liabilities for the former Afton TSF, Ajax East and Ajax West pits, Mine Rock Storage Facilities, and associated seepage collection structures with site activities focused on general care and maintenance of historic facilities, reclamation research and development, and noxious weed control. Current security bond held by the BC MEM is $350,000 CDN dollars.

Final mine closure of the proposed Ajax project will occur when either all mineable and economic mineral reserves have been exhausted or if a commercial decision is made by KAM management to permanently cease operation. An important consideration of final closure is the effect of mine closure on employees, contractors and suppliers and the public. It is KAM's aim to plan for closure so that adequate notice (if possible, in the order of a year or more) can be given to employees and the public.

Decommissioning and closure activities are expected to take up to five years. Most buildings and associated infrastructure may be closed in a shorter time frame, however, closure and reclamation of the TSF is expected to take longer time frame. In the decommissioning and closure phase, the TSF and MRSFs will be reclaimed and infrastructure not required in the post-closure period will be decommissioned, demolished or removed from site. A five-year post-closure phase is assumed for the purpose of the MCRP during which monitoring and maintenance will be ongoing. Reclamation will not be considered complete until a site reclamation report stating that it successfully meets applicable standards has been signed off by qualified professionals and by government agencies.

Monitoring and maintenance of all closed facilities and structures will continue through the decommissioning and closure and post-closure phases to confirm proper function and mitigation of environmental effects. Post-closure monitoring will begin after closure and decommissioning activities are completed, as determined by the on-site plans and regulatory requirements. The length of required post-closure monitoring will be based on monitoring results, and the requirements of relevant government agencies.

20.5.1 Planned Closure Activities

Activities undertaken during the decommissioning and closure phase include, but are not necessarily limited to:

- Contouring of mine rock storage areas, capping, covering with topsoil and re-vegetating
- Removal of most of infrastructure such as buildings, equipment, fuel tanks, which will involve blasting, earth-moving, loading, hauling, and appropriate disposal
- Storage and transportation of hazardous and non-hazardous materials for disposal in approved offsite facilities
- Implementation and maintenance of site security and emergency services appropriate for closure activities
- Changes to the site water management system such that surface contact water and TSF ponded effluent is pumped to the open pit to support conversion to a pit lake and re-establishment of passive drainage for Peterson Creek within the current waterway.
- Reclamation of TSF surface with a cover system designed to minimize infiltration to underlying materials and provide a medium for establishing sustainable vegetation cover consistent with the final intended land use; runoff from the reclaimed surface will shed to the environment (Humphrey Creek)
- Transportation of workers and goods in and out of the mine site
- Environmental monitoring and progressive reclamation.

Activities undertaken during the post-closure phase (which will continue as necessary based on monitoring results and regulatory requirements) include, but are not necessarily limited to:

- Pumping of surface contact water to the open pit for continued pit lake filling
- Maintenance of reclaimed areas where required (e.g. regrading and revegetation)
- Transportation of workers and goods in and out of the mine site
- Environmental monitoring.

20.5.2 Temporary Closure Activities

In the event of temporary closure (care and maintenance), activities that will be undertaken include, but are not necessarily limited to:

- Access to the site will be controlled, all buildings and facilities will be secured and restricted to authorized personnel only
- Mechanical, hydraulic and electrical systems not required during the temporary closure period will be locked out and maintained in a secure state (i.e. in a no-load condition)
- Mobile heavy equipment that is not required during temporary closure will be stored in appropriate areas in a no-load condition

- Warning signs will be posted around open pit(s) and other mine openings; openings without a gatehouse will be guarded or barricaded
- Routine site monitoring and inspections will continue throughout the period of temporary closure; the TSF and associated infrastructure monitoring systems will be maintained during the temporary closure period
- An inventory of hazardous materials will be completed, including process chemicals and reagents and petroleum products; hazardous materials and other chemicals will be properly stored or removed from site
- Fluid levels in all fuel tanks will be recorded and routinely inspected for leaks or potential hazards
- Explosives will be relocated to the main magazine and secured, disposed of, or removed from site
- MRSFs and ore stockpiles will be maintained such that they are physically stable; storage areas and stockpiles will be routinely inspected to ensure their stability or to implement any required contingency measures
- Surface water management measures will continue through temporary closure, and will be monitored to ensure proper operation; surface water quality and quantity will be monitored to ensure that regulatory requirements are being met.

In addition, during the operation phase, a pond will be established within the TSF to allow recycling of the effluent to the process plant. In the event of temporary closure, this stored water will remain in the TSF pond. Recycling to the process plant will stop, and water levels in the TSF will be monitored to determine the net accumulation of water. If temporary closure is prolonged (i.e., more than a year), it may be necessary to treat and decant the tailings supernatant to maintain safe water levels. The need for treating and decanting the tailings supernatant is a function of the duration of temporary closure as well as how much capacity remains in the TSF and will be addressed through the appropriate regulatory processes.

20.5.3 Mine Closure Cost Estimate within the Application/EIS

A financial security is required as a condition of all *Mines Act* permits for all, or part of, outstanding costs associated with mine reclamation and the protection of land, watercourses, and cultural resources, including post-closure commitments. The security held under the *Mines Act* (1996a) can also be used to cover the requirements of legislation, permits, and approvals of other provincial agencies.

The objective of BC's reclamation security policy is to provide reasonable assurance that the Provincial Government will not have to contribute to the costs of reclamation and environmental protection if a mining company defaults on its obligations. In the case of a company default, the security amount should be sufficient to allow Government to successfully manage the environmental issues at the mine site, complete any outstanding reclamation requirements, and continue to monitor and maintain the site for as long as is required (BC MEMPR 2008). Typically, MEM reviews the reclamation security at a mine site every five years, or whenever significant changes occur at the mine. The security obligation may increase or decrease depending upon assessed liability at the time and financial factors such as real return bond yields. The costing developed for the Application/EIS is a high-level cost estimate developed for full closure of the mine at the end of the planned mine life. During the permitting stage, more detailed costs estimates will be developed, including a detailed estimated for the first 5 years of operation.

Following is the cost estimate for closure and reclamation as presented in the Application/EIS. This preliminary estimate is for expected costs at the end of mine life in 2015 Canadian dollars but does not factor progressive reclamation during mining operation that may reduce costs during closure and decommissioning. Contractor rates (BC Road Builders and Heavy Constructing Association; 2014 – 2015 Blue Book) have been used in developing the costs and no allowance for offsetting against salvage value has been made. The cost estimates are presented under the headings of Closure, Reclamation and Monitoring/Indirect costs. The cost estimate for closure and reclamation for the Feasibility Update is provided for others and included as part of sustaining capital presented in Section 21. The cash flow analysis presented in section 22 conservatively assumes the cost for a letter of credit (in a form acceptable to government) is carried for the life of the project in the amount presented in the Application/EIS.

20.5.3.1 Closure Costs

Closure cost estimates presented in the Application/EIS are provided for decommissioning of the following infrastructure:

- Demolition of the process plant, truck shop, crusher and conveyors, administrative and other buildings
- Decommissioning of the Peterson Creek diversion, tailings lines and water management ponds
- Removal of freshwater pipeline from Kamloops Lake and the power transmission line
- Removal of any solid waste remaining at closure.

The closure cost estimate is $7.2 million CDN.

20.5.3.2 Reclamation Costs

Reclamation costs presented in the Application/EIS are based on restoring the landscape and reclaiming the surface on mine closure. Reclamation includes site preparation, hauling and spreading of reclamation materials and re-vegetation. Cost estimates for reclamation of the following areas are provided:

- Safety measures around the open pit
- Reclamation of the MRSF and TSF embankments and surface
- Reclamation of the ore stockpile footprint areas and the plant and truck shop footprint areas
- Re-establishment of Peterson Creek, reclamation of contact water ponds and tailings pipeline corridors
- Reclamation of water and transmission line corridors and roads.

The largest cost item is to establish the closure cover system for the TSF ($105 million). The total reclamation cost estimate is $178 million CDN.

20.5.3.3 Monitoring & Indirect Costs

For initial planning purposes the Application/EIS assumes monitoring costs for ten (10) years with decreased frequency after five (5) years for geotechnical, water quality, aquatic effects and reclamation monitoring and maintenance. Indirect costs include engineering design, construction management, road maintenance, security and administration.

Monitoring and indirect costs are estimated at $10 million CDN.

Total closure costs are presented in the Application/EIS are estimated at approximately $195 million CDN.

21 Capital and Operating Costs

21.1 Introduction

A summary of LOM capital and operating costs not discounted are summarized in Table 21-1. The discussion on the basis of these numbers will be described in the following sections.

Table 21-1: LOM Capital and Operating Costs Summary

Cost Summary	LOM Total ($M USD)
OpEx	
Mining Cost	$2,265
Process Cost	$1,806
G&A	$460
Offsite Costs	$1,116
Total OpEx	**$5,648**
Income Taxes	$718
CapEx	
Initial Development CapEx	$1,307
Undiscounted Sustaining CapEx	$358
Total CapEx	**$1,666**

The Ajax Project is based on a throughput of 65,000 t/d open pit operation. This capital cost estimate has been prepared and is incorporated into this report.

All values are expressed in US Dollar currency based on end of third quarter 2015. Metric units were assumed throughout the estimate.

Third party input was provided as follows:

- Tailing Storage Facility: Norwest
- Fresh Water Supply: Urban Systems/Fluor
- Process Operating Expenses - KAM
- Owner's Cost General and Administrative: KAM
- Site Infrastructure and processing facilities: Fluor
- Unit Pricing of major commodities supplied by EPC bid proposals: Analysis by M3 Engineering

21.2 Initial Capital Costs

21.2.1 Capital Cost Summary

The direct capital cost for initial development of the Ajax Project is summarized in Table 21-2.

Table 21-2: Capital Cost Summary

Cost Item	Total ($M USD)
Project Directs	680.5
Project Indirects	109.2
Contingency	79.0
Subtotal Directs & Indirects	**$ 868.7**
Mining (w/ contingency)	$ 279.4
KAM G&A	$ 85.3
Capitalized Mill Turn Over	$ 32.4
Kinder Morgan Pipeline (w/ contingency)	$ 28.7
BC Hydro Connection (w/ contingency)	$ 12.7
Subtotal Owner's, Mining & Other	**$ 438.5**
Grand Total	**$ 1,307.2**

21.2.2 Currency

The capital cost estimate is reported in United States dollars (USD).

21.2.3 Labour Rates

Burdened labour rates used in the initial capital cost estimate are as shown in Table 21-3.

Table 21-3: All-Inclusive Labour Rates

Discipline	*Labour Rate (US$/h)
Civil	67.00
Concrete	70.83
Structural	82.60
Architectural	85.00
Mechanical	82.60
Piping	88.65
Electrical	83.80
Instrumentation	83.80

*Values based on $1.33CDN= $1.00US

21.2.4 Contingency

Contingency is a cost that will statistically occur based on historical data. The term is not used to cover changes in scope, errors, or lack of sufficient information to meet a desired accuracy range. Contingency is provided to cover items of cost which fall within the scope of work, but are not known or sufficiently detailed at the time the estimate is developed; however, on a statistical basis these items will occur.

21.2.5 Mining Capital Cost Estimate

There are no allowances for duties and escalation in the capital cost estimate.

Capital costs are based on the following:

- Initial purchases and replacements of major mining equipment are based on budgetary quotations from equipment suppliers.
- A portion of the initial mine production fleet will be financed through a capital lease. Equipment capital cost values shown in Table 21-3 reflect the full asset value. Cash flows have been adjusted in the economic model to reflect the deferral of capital expenditure and lease payments.
- Benchmarked costs were used where budgetary quotations were not available.

Initial mine capital costs are summarized in Table 21-4.

Table 21-4: Initial Mine Capital Costs

WBS	Cost Type	Total ($M USD)
1330	Drilling Equipment	15
1620	Blasting	2
1320	Loading Equipment	77
1310	Hauling Equipment	51
1340	Support Equipment	19
1350	Miscellaneous Equipment	15
1460	Power Supply	0.1
1440	Pit Dewatering	0.3
1500	Mine Systems	7
9120	Road & Topsoil Removal	8
9110	Pre-Strip	70
	Provincial Sales Tax	2
	Subtotal Directs	264
9600	Mine Indirect	7
	Contingency	**8**
	Total Mine Capex	**279**

Note: Additional mine contingency is added in the economic model for the construction period. Totals subject to rounding in calculation.

Initial mine capital cost variances could negatively affect the project economics. During detailed engineering reconciliation should be done to check the actual mine capital cost estimates.

21.2.6 Capitalized Mill Turn Over

Mill turn over cost of $32M is based on the six months of operations cost between the end of construction through the ramp up to commercial production.

21.2.7 KAM G&A, and Other Capital Costs

G&A costs associated with the owners operations, preparations, and construction support until the point of commercial production are captured in the developmental capital.

Kinder Morgan and BCH line items capture the costs of pipeline relocation and power transmission elements required for the project. These construction activities are considered as exterior to the construction activities on site.

21.2.8 Estimate Accuracy

The accuracy of this estimate for those items identified in the scope-of work is within the range of plus 10% to minus 10%; i.e., the cost could be 10% lower than the estimate or it could be 10 % higher. Accuracy is an issue separate from contingency, the latter accounts for undeveloped scope and insufficient data (e.g., geotechnical data).

21.3 Sustaining Capital Costs

Two areas of sustaining capital on the project are mining and the staged progression of the tailings storage facility (TSF).

21.3.1 Mining Sustaining Capital Costs

There are no allowances for duties and escalation in the capital cost estimate.

Capital costs are based on the following:

- Equipment fleet build-up purchases and replacements of major mining equipment are based on budgetary quotations from equipment suppliers.
- Benchmarked costs were used where budgetary quotations were not available.
- Equipment replacement assumptions.

Table 21-5: Mining Sustaining Capital Cost

Year	Mining ($M USD)
1	94
2	38
3	1
4	4
5	3
6	7
7	15
8	23
9	21
10	10
11	9
12	6
13	4
14	2
15	1
16	1
17	1
18	1
Total	**241**

Note: Yearly totals have been rounded and the sum of the yearly totals may differ due to this rounding.

Mine sustaining capital cost variances could negatively affect the project economics. During detailed engineering reconciliation should be done to check the actual mine sustaining capital cost estimates.

21.3.2 TSF Sustaining Capital Costs

Sustaining capital cost for the TSF is based on the total earthworks installed per annum to raise the overall height of the TSF wall facility. MTOs were provided by Norwest and unit rates applied are consistent with the initial capital cost for the TSF. Costs are reported in Table 21-6 as Q3 2015 US dollars.

Table 21-6: TSF Sustaining Capital Costs

Year	Total ($M USD)
1	2.76
2	11.11
3	10.44
4	7.45
5	7.05
6	5.79
7	5.55
8	5.55
9	5.90
10	6.54
11	5.48
12	5.48
13	6.26
14	5.48
15	1.85
16	1.53
17	1.13
18	1.56
Total	**96.92**

21.3.3 Reclamation Sustaining Costs

A closure and reclamation cost estimate was developed by KAM using the State of Nevada Reclamation and Closure Cost Estimator (SRCE). The SCRE has been adopted by KAM for use across its assets in estimating closure and reclamation costs. Unlike the estimate provided for the Application/EIS, the SCRE is based on an assumption that the work is undertaken by the owner, KAM, and not a third-party. The cost of reclamation and closure as developed by KAM using the SCRE is US$94.3M.

21.4 Operating Cost Estimate

21.4.1 Mining Operating Cost Estimate

Operating cost estimates have been assembled by area and component, based on estimated staffing levels, consumables, and expenditures; according to the mine schedule. Operating costs have been prepared in 2015 US dollars with no allowances for escalation or contingency with the exception of diesel and electrical power costs. These costs are based on market forecast data.

21.4.1.1 Basis of Estimate

The work schedules assume that production will operate 24 h/d, 7 d/wk, 365 d/y. Four main production and maintenance crews will work on a rotation basis and will be supported by various personnel working on a variety of schedules.

The mine operating cost estimate, calculated on an annual basis (quarterly for first five years), includes equipment operating and maintenance labour, equipment maintenance, consumables and supplies, outside services, and provincial taxes. First principle calculations were completed to determine the operating cost estimate based on a combination of internal expertise and vendor support. The collaborative approach between internal metrics and vendor information defined a variety of performance indicators including consumption rates, unit costs, productivity estimates, and labour requirements. Together with the mine production schedule, the performance indicators resulted in a detailed mine operating cost estimate.

21.4.1.2 Summary

The resulting LOM mining operating costs are summarized below in Table 21-7.

Table 21-7: Mine Operating Costs

Area	Total Cost ($M USD)	Unit Cost (US$/t mined)
Drilling	102	0.07
Blasting	297	0.20
Loading	285	0.19
Hauling	998	0.66
Support	258	0.17
Mine General	325	0.22
Total Cost	**2,265**	**1.50**

Note. Operating costs shown are for the life of mine average, excluding costs incurred during construction, commissioning, and ramp-up. Similarly, unit costs are reported on a tonnage basis excluding pre-stripping.

Variances in the mine operating costs could negatively affect the Mineral Reserve estimate and project economics. During mine operations reconciliation should be done to check the mine operating cost estimates.

21.4.2 Process Operating Cost Estimate

The processing operating cost is estimated to be US$4.31/t ore milled. The LOM Process operating costs are summarized in Table 21-8.

Table 21-8: Process Operating Costs

LOM* Mill Feed @ 426 M tonnes		
Area	**Total Cost ($M USD)**	**US$/t ore**
Maintenance	287	0.68
Supplies	733	1.72
Consumables	405	0.95
Outside Service	80	0.19
Salaries & Wages	279	0.64
Taxes	52	0.12

Total	**1,839**	**4.31**

*LOM process cost include capitalized pre-production period.

21.4.2.1 Basis of Estimate

The basis of the operating cost estimate describes the methodology followed and the deliverables produced and is representative of the proposed operating and maintenance philosophy for the facilities. The estimate assumes 24 hour per day operation, 365 days per year, with an availability of 92%.

21.4.2.1.1 Zero Base Budgeting

The process operating cost was developed from a zero based budget, using the feasibility update testing results, supplier data for costing and scheduling of repairs, operational area, ramp-up, and benchmarking of similar operations.

21.4.2.1.2 Contingency

No contingency is included in the operating cost.

21.4.2.1.3 Scope of Estimate

The scope of the estimate is expected to encompass the following areas of the project:

- Material Handling and Crushing
- Concentrate Processing Plant
- Process and Site Utilities
- Tailings and Water Management Facilities
- Site Services

21.4.2.1.4 Production Basis

The estimate is based on the nominal production rate of 65,000 t/d.

21.4.2.1.5 Sources of Input

The following items provided input to the operating cost estimate:

- Supplier information on costs and repair scheduling for maintenance supplies
- 2014 & 2015 Metallurgical Test Program
- Production Schedule Mine Plan 2015
- 2015 Engineering Deliverables:
  - Process Design Criteria
  - Mechanical Equipment List
  - Electrical Power Load List
  - Process Flow and Process Instrumentation Diagrams
  - Process Control Philosophy
- Operating consumables cost.

21.4.2.2 Labour

Table 21-9: Process Labour Count

Description	Total
Helpers	13
Apprentices	4
Operators	41
Trade Specialists/Journeymen	32
Supervisors	17
Technicians	33
Engineers	11
Total Labour Force	**151**

21.4.2.3 Operating Consumables

Process operating costs include consumption of chemical reagents, grinding media, etc. The estimate was calculated based on the engineering process design criteria, which were developed from the 2014 and 2015 Metallurgical Test Program. Pricing for supplies were updated.

Process operating consumables costs average $20 M per annum.

21.4.2.4 Power

The Mechanical Equipment List and Electrical Load List produced during engineering were utilized for the operating cost estimate. Electricity price is at $0.052 USD/kWh (based on BC Hydro rates). Annual process power usage and costs are shown in Table 21-10.

Table 21-10: Process Power Costs

Area	MWh/y	Unit Cost (US$/t Ore)
Primary Crusher & Conveying	44,166	0.098
COS Reclaim & Conveying	3,613	0.008
Secondary Screening & Conveying	12,664	0.028
Secondary Crushing & Conveying	28,720	0.064
FOS Reclaim & Conveying	3,412	0.008
HPGR Screening & Conveying	11,551	0.026
HPGR Crushing & Conveying	106,493	0.237
Grinding & Classification	316,729	0.704
Cyclone Feed Pumps	31,509	0.070
Rougher Flotation	29,193	0.065
Primary Regrind	25,116	0.056
Cleaner Flotation	16,274	0.036
Secondary Regrind	8,396	0.019
Reagent Area	2,135	0.005
Filtration	5,567	0.012
Tailings	39,874	0.089
Water Reclaim	11,431	0.025
Water Management System	61,550	0.137
Assay Lab	1,814	0.004
Total	**760,207**	**1.689**

21.4.2.5 Equipment Maintenance

Equipment maintenance costs were based on engineering equipment list. Operational strategy is to self-perform equipment and plant maintenance.

21.4.2.6 Maintenance (Supplies)

Maintenance supplies were calculated from Zero Base, with supplier support in cost and scheduling for repairs. Annual maintenance supplies include:

- Primary crusher mantles and concave liners;
- Secondary cone crusher, bowls & mantles, and critical spares;
- Secondary dry screen media, liners and critical spares;
- HPGR wear parts including prorated HPGR roll replacements;
- Tertiary wet screen media, liners, and critical spares;
- Ball mill liners;
- Cyclones feed pump impellers and liners;
- Tower mill liners and critical spare parts;
- Filter press spare parts.

21.4.2.7 Insurance & Taxes

Insurance is covered in G&A. Provincial sale taxes (PST) have been included for power, fuel, oil, lube and filters, as these items are not tax exempt during operations.

21.4.2.8 Outside Services

Outside services costs consider assistance from the suppliers. Major component rebuilds will be performed by a third party.

21.4.2.9 Tailings Storage Facility and Water Management Cost

Tailings operations are considered in process operations costs. Pumping requirements were developed based upon design parameters for pump system operating hours as follows:

- The Tailings pump system is estimated to be running 24 h/d, 365 d/y, at an overall plant availability of 92% (based on Process Design Criteria).
- The Reclaim pump system is estimated to be running at 80% power capacity, 24 h/d, 365 d/y, at an overall plant availability of 92% (based on Process Design Criteria).
- Peterson Creek pumps operating three months at capacity, and three months at 50% capacity (average annual operating percentage of 37.5%).
- Pit dewatering pumps operating for approximately 200 hours over the course of one year for ongoing dewatering. The hours were calculated based on total annual inflow, average annual precipitation and the design pumping rate. The operating cost considered both diesel and electricity power rates and applied as appropriate to the pit dewatering system (average annual operating percentage of 2.3%).

Seepage collection pond and water management pond pumps operating on electric power for approximately 150 total hours per year.

21.4.3 General & Administrative (G&A) Operating Costs

G&A costs through period of pre-production (year -3,-2,-1) are included as initial capital cost.

G&A captures operational costs not directly related to the mining and processing operations include site management, health, safety, environment, taxes, etc. G&A costs include KAM corporate management cost allocations, Sugarloaf Ranch operating costs, expenses related to the asset retirement obligation (ARO), and the accretion entry each year.

In operations, total G&A becomes relatively consistent annually at $21 M. Table 21-11 shows the high-level details making up the normalized G&A operating costs. The largest component is in the financial section, where property taxes and insurance account for over $7 million annually. This is followed by project team costs, which consist of the G&A payroll.

Table 21-11: Normalized G&A Operating Costs

Description	$000/Year	US$/tonne ore
Fire System	8	0.001
Site Administration Services	170	0.013
Environment	698	0.053
Health & Safety	855	0.065
External Affairs/First Nations	333	0.025
Project Team	6,845	0.517
Admin Expenses	3,225	0.244
Financial	8,446	0.638
Corporate Costs	100	
Total	**20,680**	**1.554**

Normalized operational G&A staffing is 54 broken down into the following areas as set out in Table 21-12.

Table 21-12: G&A Staffing Requirements

Area	Staffing Plan
General Management	5
Finance	6
Human Resources	4
External Affairs	3
Information Technology	3
Environmental	5
Health & Safety	12
Supply Chain	16
Total	**54**

21.4.4 Royalties

An allowance for First Nations royalties has been included in the G&A costs. All other royalty agreements are planned to be purchased before the start of operations. Allowances have been included in the G&A costs for the royalty purchases.

21.5 Off-site Process Costs

Transportation and handling of copper concentrates have been included in the LOM operating costs. These costs include penalties and charges as described in Section 19.5 and 19.6. The LOM off-site treatment cost are estimated to be $1,116 M.

22 Economic Analysis

The model was compiled using best available information at the time. Due to risks and uncertainty related to global economic factors, governmental regulations and environmental considerations and other inherent risks associated with a mining project of this size and scale, actual results may differ materially from those reflected in the model.

Development of economic model was performed by KAM and reviewed by the qualified professional.

22.1 Assumptions

The model was built using various assumptions that are based on current and projected future expected economic conditions including, but not limited to, sales prices, operating costs, annual production, ore grades and exchange rates.

Key assumptions are outlined in Table 22-1.

Table 22-1: Key Assumptions

Description	Value
Total Tonnes To Mill ('000)	426,293
Average Annual Tonnes To Mill ('000)	23,725
Mine Life (Years)	18
Average Head Grade	
Copper (%)	0.29
Gold (g/t)	0.19
Total Production	
Copper (000 lb)	2,312,771
Gold ('000 oz)	2,240
Average Annual Production	
Copper ('000 lb)	127,429
Gold ('000 oz)	123
Discount Rate	8.0%

22.1.1 Pricing

Metal pricing is based on a variable metal price prediction. For metal price predictions see Section 19.3.

Long term averages of copper, gold, and silver pricing per pound and ounce, respectively, are:

- Copper - $3.21 per lb
- Gold - $1200 per oz
- Silver - $16 per oz

22.1.2 Exchange Rates

Currency exchange rates used in the cost estimates are 1 USD to 1.20 CAD. All currency in this report is expressed in US Dollars unless otherwise stated.

22.1.3 Operating Cost Inputs

Average long term operating cost inputs are:

- Diesel - $0.73/l
- Natural Gas - $3.37/MMBtu
- Power - $0.052/kWh

22.1.4 Cash Flow

Figure 22-1 and Figure 22-2 set out the cash flow by year and a perspective on the cumulative cash flow based on the base case (Section 22.2).

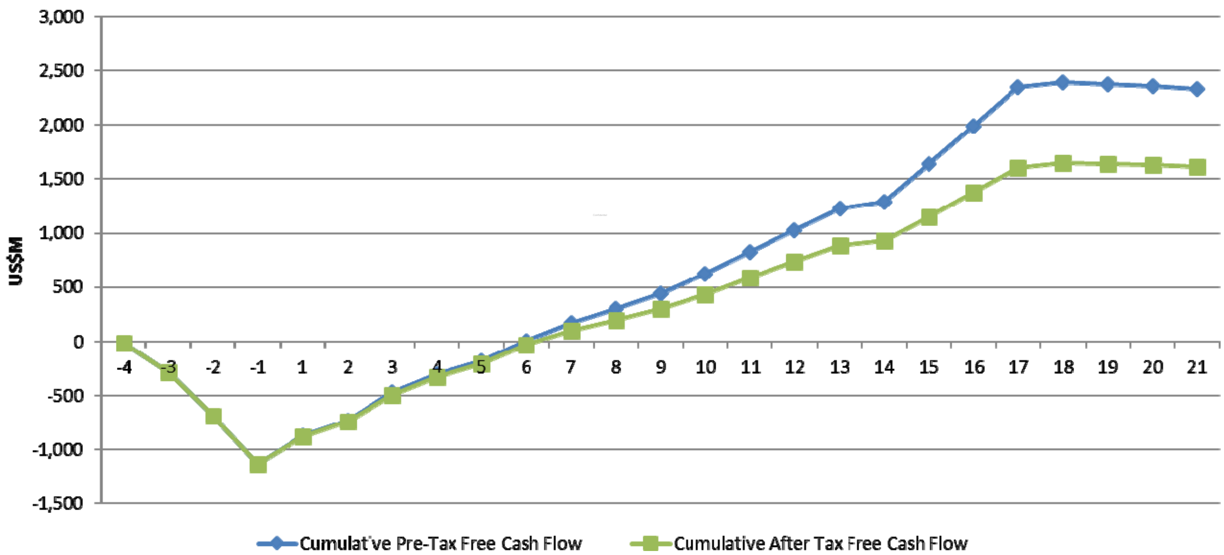


Figure 22-1: Cumulative Cash Flow ($M USD)

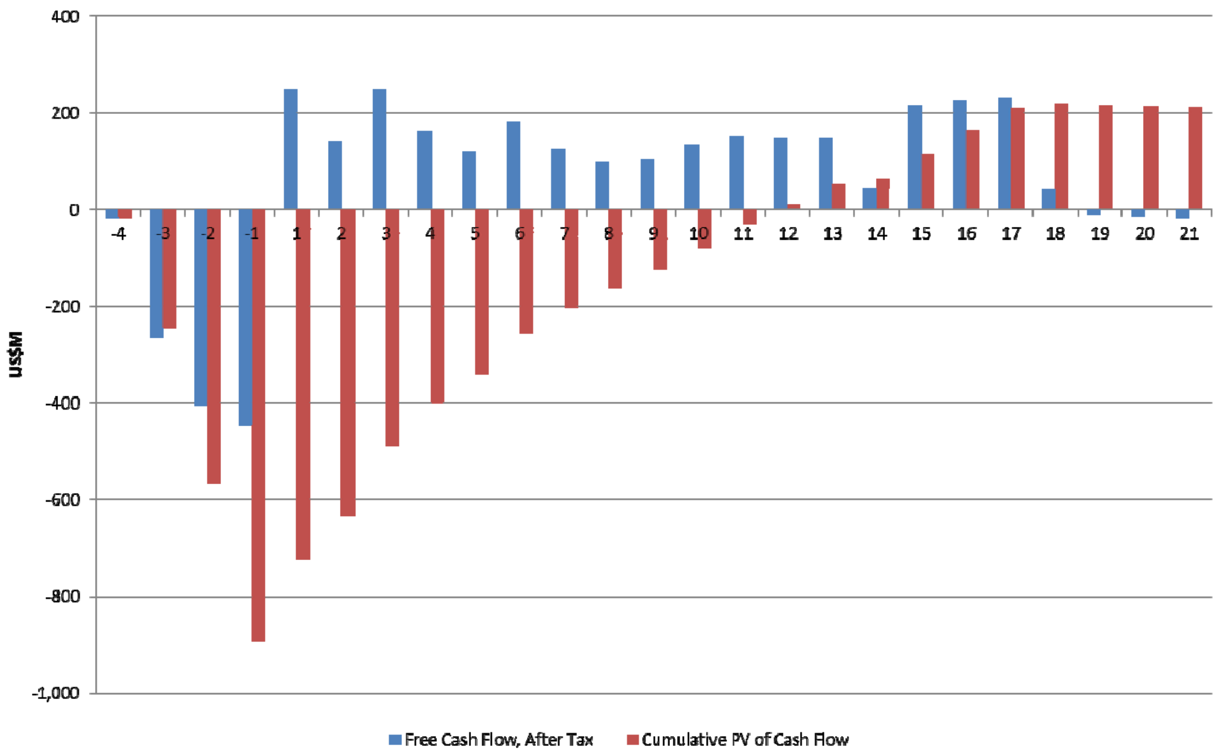


Figure 22-2: Cash Flow by Year & Cumulative Discounted Cash Flow ($M USD)

22.2 Base Case Results

The base case economics were developed as described in the above. Initial results show an after-tax NPV of $215.6 million and an IRR of 11.1% with a payback period of 6.7 years. Table 22-2 shows the base case valuation metrics, cost summary and mine operational metrics.

Table 22-2: Valuation Metrics

Valuation Metrics	Units	LOM Total
Revenue	$M USD	$9,806.3
EBITDA	$M USD	$4,158.7
Free Cash Flow, Pre-Tax		
NPV @ 8%	$M USD	$429.4
ROIC		43.9%
IRR		13.4%
Payback Period	Years	6.48
Discounted Payback Period	Years	10.52
Free Cash Flow, After Tax		
NPV @ 8%	$M USD	$215.6
ROIC		22.0%
IRR		11.1%
Payback Period	Years	6.72
Discounted Payback Period	Years	12.20

Cost Summary		LOM Total
OpEx		
Mining Cost	$M USD	$2,265
Process Cost	$M USD	$1,806
G&A	$M USD	$460
Offsite Costs	$M USD	$1,116
Total OpEx	**$M USD**	**$5,648**
Income Taxes	$M USD	$718
CapEx		
Initial Development CapEx	$M USD	$1,307
Undiscounted Sustaining CapEx	$M USD	$358
Total CapEx	**$M USD**	**$1,666**

Mine Operational Metrics		LOM Total
Life Of Mine	Years	18
Mined Volumes		
Total Waste Mined	M tonnes	1,130.2
Total Ore Milled	M tonnes	426.3
Lom Strip Ratio		2.65
Payable Production		
Cu - Copper	Mlbs	2,214.7
Au - Gold	Koz	2,165.7
Ag - Silver	Koz	1,167.2

22.3 Taxes & Royalties

The model considers all regulatory applicable taxation levies at the rates currently in effect.

An allowance for First Nations royalties has been included in the G&A costs. All other royalty agreements are planned to be purchased before the start of operations. Allowances have been included in the G&A costs for the royalty purchases.

22.4 Sensitivity Analysis

The sensitivity analysis shown in Figure 22-3 reflects the changes in the valuation metrics based on the various factors identified in the chart.

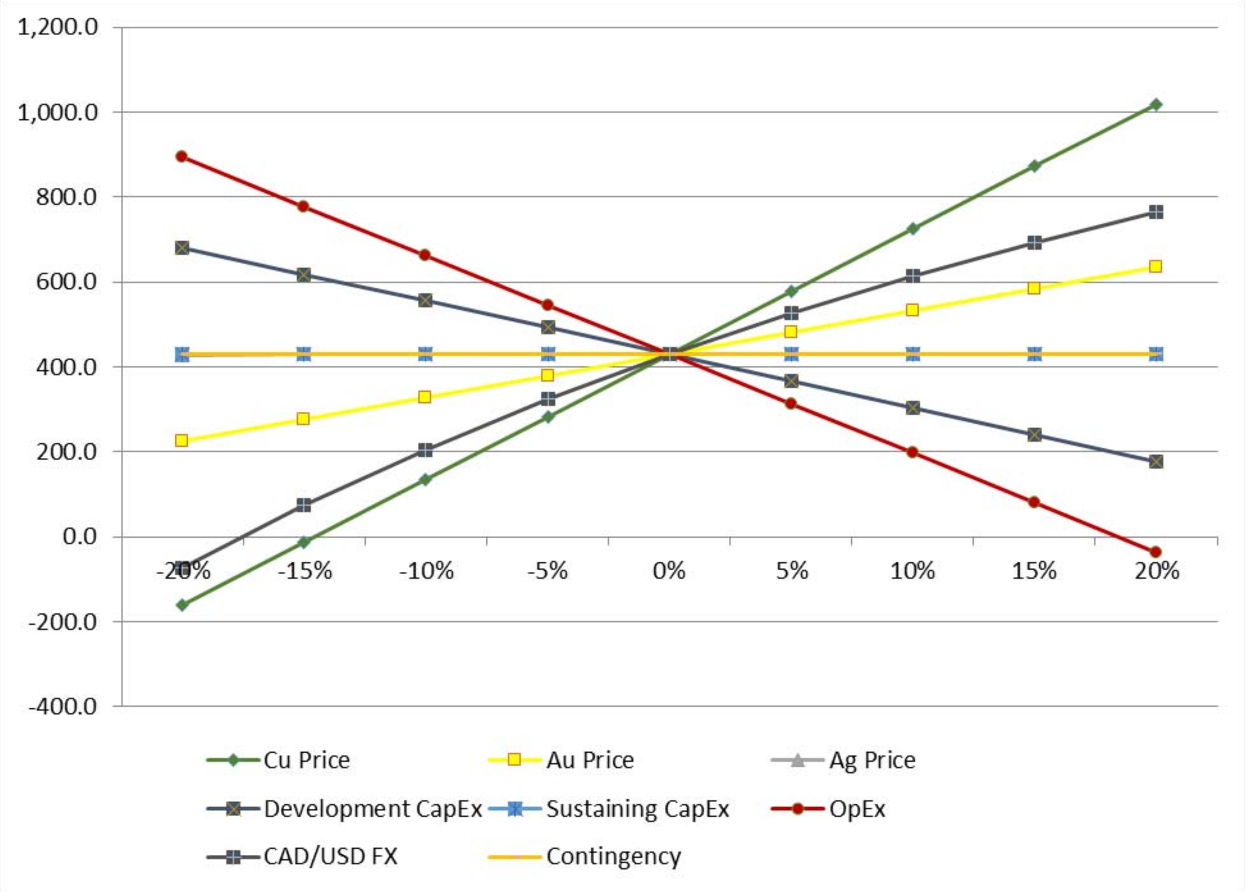


Figure 22-3: Pre-Tax NPV Sensitivity Analysis ($M USD)

23 Adjacent Properties

23.1 New Afton Copper-Gold Project

Mineralization at New Afton is not necessarily indicative of any mineralization at Ajax. The author is not able to verify the information presented in this section.

The New Afton copper-gold project, being operated by New Gold is located approximately 10 km northwest of the Ajax property. Mineralization at New Afton is hosted in the Cherry Creek phase of the Iron Mask Batholith. The mineralization is controlled by east-northeast striking steeply dipping faults that are constrained within a west-northwest striking structural corridor. The New Afton deposit is being mined using underground block cave method. New Afton began production in June 2012 and began commercial production in July 2012. The underground operation is expected to produce, on average, 85,000 ounces of gold and 75 million pounds of copper per year over a 12-year mine life. According to the New Gold website, metal production at New Afton is expected to reach 90,000 ounces of gold and 90 million pounds of copper for each of 2016 and 2017.

The mineral reserve estimates for the New Afton Mine, as at December 31, 2014, as presented on the New Gold website and supported by an NI 43-101 compliant technical report, is presented in Table 23-1.

Table 23-1: Mineral Reserve Estimate

		Metal grade			Contained metal		
	Tonnes 000s	Gold g/t	Silver g/t	Copper %	Gold koz	Silver koz	Copper Mlbs
Proven	-	-	-	-	-	-	-
Probable	42,026	0.56	2.3	0.84	760	3,119	781
Total New Afton P&P	**42,026**	**0.56**	**2.3**	**0.84**	**760**	**3,119**	**781**

Notes. 1. New Gold's Mineral Reserves and Mineral Resources have been estimated in accordance with the CIM Standards, which are incorporated by reference in NI 43-101. **2.** Year-end 2014 Mineral Reserves for the Company's mineral properties have been estimated based metal prices of $1,200/oz Au, $18.00/oz Ag and $3.00/lb Cu and a lower cut-off of $21.00/t B1 & B2 Zone; $24.00/t B3 Zone. **3.** New Gold reports its Measured and Indicated Mineral Resources exclusive of Mineral Reserves. Measured and Indicated Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. Inferred Mineral Resources have a greater amount of uncertainty as to their existence, economic and legal feasibility, do not have demonstrated economic viability, and are likewise exclusive of Mineral Reserves. **4.** Year-end 2014 Mineral Resources for the Company's mineral properties have been estimated based on metal prices of $1,300/oz Au, $20.00/oz Ag and $3.25/lb Cu and a lower cut-off criteria of 0.40% CuEq. **5.** Mineral Resources are classified as Measured, Indicated and Inferred and are reported based on technical and economic parameters consistent with the methods most suitable for their potential commercial exploitation. Additional details regarding Mineral Reserve and Mineral Resource estimation, classification, reporting parameters, key assumptions and associated risks for each of New Gold's material properties are provided in the respective NI 43-101 Technical Reports, which are available at www.sedar.com.

23.1.1 Mineral Resources

The mineral resource estimate for the New Afton Mine as at March 10, 2015, exclusive of mineral reserves, is presented in Table 23-2.

Table 23-2: Measured & Indicated Mineral Resource Estimates (Exclusive Of Mineral Reserves)

		Metal grade			Contained metal		
	Tonnes 000s	**Gold g/t**	**Silver g/t**	**Copper %**	**Gold Koz**	**Silver Koz**	**Copper Mlbs**
A&B Zones							
Measured	15,878	0.76	2.3	0.95	390	1,183	334
Indicated	9,031	0.50	2.4	0.75	146	705	149
A&B Zone M&I	24,909	0.67	2.3	0.88	535	1,878	483
C-Zone							
Measured	10,187	1.11	2.5	1.18	364	819	266
Indicated	27,766	0.76	2.1	0.90	682	1,848	548
C-Zone M&I	37,953	0.86	2.2	0.97	1,046	2,672	814
HW Lens							
Measured	-	-	-	-	-	-	-
Indicated	10,180	0.52	2.1	0.45	170	691	100
HW Lens M&I	10,180	0.52	2.1	0.45	170	691	100
Total New Afton M&I	**73,042**	**0.75**	**2.2**	**0.87**	**1,751**	**5,235**	**1,397**

Notes. 1. New Gold's Mineral Reserves and Mineral Resources have been estimated in accordance with the CIM Standards, which are incorporated by reference in NI 43-101. **2.** Year-end 2014 Mineral Reserves for the Company's mineral properties have been estimated based metal prices of $1,200/oz Au, $18.00/oz Ag and $3.00/lb Cu and a lower cut-off of $21.00/t B1 & B2 Zone; $24.00/t B3 Zone. **3.** New Gold reports its Measured and Indicated Mineral Resources exclusive of Mineral Reserves. Measured and Indicated Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. Inferred Mineral Resources have a greater amount of uncertainty as to their existence, economic and legal feasibility, do not have demonstrated economic viability, and are likewise exclusive of Mineral Reserves. **4.** Year-end 2014 Mineral Resources for the Company's mineral properties have been estimated based on metal prices of $1,300/oz Au, $20.00/oz Ag and $3.25/lb Cu and a lower cut-off criteria of 0.40% CuEq. **5.** Mineral Resources are classified as Measured, Indicated and Inferred and are reported based on technical and economic parameters consistent with the methods most suitable for their potential commercial exploitation. Additional details regarding Mineral Reserve and Mineral Resource estimation, classification, reporting parameters, key assumptions and associated risks for each of New Gold's material properties are provided in the respective NI 43-101 Technical Reports, which are available at www.sedar.com.

23.1.2 Inferred Mineral Resource

The Inferred Mineral Resource Estimate for the New Afton Mine as at March 10, 2015 is presented in Table 23-3.

Table 23-3: Inferred Mineral Resource Estimates

		Metal grade			Contained metal		
	Tonnes 000s	**Gold g/t**	**Silver g/t**	**Copper %**	**Gold Koz**	**Silver Koz**	**Copper Mlbs**
A&B-Zone	6,154	0.35	1.4	0.37	69	269	50
C-Zone	6,965	0.47	1.5	0.53	105	329	82
HW Lens	966	0.69	1.5	0.46	21	45	10
New Afton Inferred	**14,085**	**0.43**	**1.4**	**0.46**	**195**	**643**	**142**

Notes. 1. New Gold's Mineral Reserves and Mineral Resources have been estimated in accordance with the CIM Standards, which are incorporated by reference in NI 43-101. **2.** Year-end 2014 Mineral Reserves for the Company's mineral properties have been estimated based metal prices of $1,200/oz Au, $18.00/oz Ag and $3.00/lb Cu and a lower cut-off of $21.00/t B1 & B2 Zone; $24.00/t B3 Zone. **3.** New Gold reports its Measured and Indicated Mineral Resources exclusive of Mineral Reserves. Measured and Indicated Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. Inferred Mineral Resources have a greater amount of uncertainty as to their existence, economic and legal feasibility, do not have demonstrated economic viability, and are likewise exclusive of Mineral Reserves. **4.** Year-end 2014 Mineral Resources for the Company's mineral properties have been estimated based on metal prices of $1,300/oz Au, $20.00/oz Ag and $3.25/lb Cu and a lower cut-off criteria of 0.40% CuEq. **5.** Mineral Resources are classified as Measured, Indicated and Inferred and are reported based on technical

and economic parameters consistent with the methods most suitable for their potential commercial exploitation. Additional details regarding Mineral Reserve and Mineral Resource estimation, classification, reporting parameters, key assumptions and associated risks for each of New Gold's material properties are provided in the respective NI 43-101 Technical Reports, which are available at www.sedar.com.

Information about the New Afton project was compiled from New Gold website (www.newgold.com). The author is not able to verify the information presented in this section. It is stated here for reference only and is not necessarily indicative of the mineralization to be found on the Ajax property.

23.2 Galaxy Copper-Gold Property

The Galaxy copper-gold property, owned by Discovery-Corp Enterprises Inc., is located near Kamloops, British Columbia, seven kilometers east-southeast of the New Gold Inc.'s New Afton Mine and four kilometers northwest of the Ajax Project.

The Galaxy deposit is an elongate, northwest-trending fault-bounded zone of copper-gold mineralization, hosted within Nicola volcanics and Sugarloaf diorite. Galaxy appears to be consistent with other alkalic porphyry hosted mineral deposits in the Iron Mask Batholith.

Discovery-Corp obtained the property in 1990 and has undertaken soil sampling, rock sampling, ground magnetic surveying, reverse circulation drilling and diamond drilling. Significant intersections from the most recent drilling in 2012 include:

- GX12-04: 0.46% Cu, 0.13 g/t Au, 0.9 g/t Ag over 33.63 metres (including 1.07% Cu, 0.30 g/t Au, 2.1 g/t Ag over 8.08 meters)
- GX12-05: 0.61% Cu, 0.14 g/t Au, 1.0 g/t Ag over 48.28 metres (including 1.07% Cu, 0.21 g/t Au, 1.5 g/t Ag over 11.00 meters)
- GX12-06: 0.44% Cu, 0.11 g/t Au, 1.1 g/t Ag over 32.78 metres (including 0.62% Cu, 0.12 g/t Au, 1.7 g/t Ag over 14.52 meters).

In 2013, metallurgical testwork was undertaken on a single master composite sample. In the locked cycle test, 81% of the copper, 59% of the gold and 40% of the silver was recovered into a concentrate grading 26% copper, 4.7 g/t Au and 45 g/t Ag from a head grade of 0.51% Cu, 1 g/t Ag and 0.14 g/t Au.

Information about the Galaxy project was summarized from a Technical Report by Christopher O. Naas, P.Geo. of CME Consultants Inc., dated October 15, 2013. This information has not been verified. It is stated here for reference only and is not necessarily indicative of the mineralization to be found on the Ajax property.

The author is not able to verify the information presented in this section. This information is not necessarily indicative of the mineralization at Ajax but is presented to provide a more comprehensive picture of the mineral deposits associated with the Iron Mask Batholith.

24 Other Relevant Data and Information

24.1 Project Execution Plan

24.1.1 Summary

The Project Execution Plan outlines how the Ajax Project is planned to be carried out. This plan contains an overall description of the main work focus areas, project organization, and how important aspects of the project will be carried out.

The proposed project execution plan incorporates an integrated strategy for engineering, procurement, and construction. The primary objective of the execution methodology is to deliver a quality project at the lowest capital cost, on schedule, and consistent with the project standards for quality, safety, and environmental compliance.

24.1.2 Objectives

The project execution plan has been established with the following objectives:

- To maintain the highest standard of safety so as to minimize incidents and accidents;
- To design and construct a process plant, together with the associated infrastructure, that is cost-effective, achieves performance specifications and achieves nameplate throughput and recoveries;
- To design and operate the mine using proven methodologies and equipment;
- To optimize the project schedule to achieve an operating plant in the most efficient and timely manner within the various constraints placed upon the project; and
- To comply with the construction and operating license conditions.

24.1.3 Project Delivery Strategy

24.1.3.1 Engineering Construction Project Manager

To ensure continuity for the overall project, the engineering and construction manager will develop engineering to maximize capital productivity through the following:

- Avoid mistakes that result in construction change orders
- Minimize field decisions by Contractors through complete engineering
- Avoid mistakes that cause excessive downstream O&M costs
- Proactively think “out-of-the-box” on occasion to avoid accepting conventional and costly design

24.1.3.2 Fixed Price EPC Contracts

- The EPC Contractors provide Turnkey services for Project Management, Process, Detail Engineering (based on Basic Engineering by others), Procurement, Construction, Mechanical Completion, Pre-commissioning, Commissioning, Start-up and Performance

Testing. The contracts will be competitively bid lump sum with unit pricing in place for any additions or deductions. This delivery method will be considered for the process plant, ancillary facilities, and power feed.

24.1.3.3 EPCM Project Delivery Contracts

- EPCM Contractor is to be responsible for administering Engineering, Procurement and Construction Management of the construction packages that are built by construction contractors. In general, M3 recommends operating with two Contractors with each trade to keep the contract leverage with the Owner. After completion of Engineering and Major Procurement, these packages will be competitively bid either lump sum or on a low unit price basis. This delivery method will be considered for earthworks, buried piping, water management and tailing facility.

24.1.3.4 Time and Material Contracts

No significant time and material contracts are envisioned.

The lone exception to this will be a small work force team contract to fill in any gaps between larger contracts.

24.1.3.5 Philosophy

The over-riding focus is to enact contracts quickly to realize a high percentage (say over 80%) of commitments very early in the project.

24.1.4 Contractor Responsibilities

The Engineering Construction Project Manager will be responsible for coordinating the combination of EPC and EPCM efforts. Each EPC and EPCM contractor will be responsible for supplying a detailed project execution plan that will be integrated into the overall Master Project Execution Plan. Such plans will provide as a minimum the following:

- Complete any Value Engineering Studies prior to Detail Engineering so that the scope of design is complete and understood before going into Detail Engineering.
- Provide quantified methodology for calculating construction progress.
- Develop a Project Schedule beginning with Basic Engineering through Permitting, Construction and Commissioning. Update monthly.
- Maintain 3 week look-ahead schedule.
- Provide PM formal weekly and monthly reports.
- Establish and maintain a trend program.
- Provide likely cash flow requirements and basis for such.
- Provide weekly expediting and logistics reports.
- Highlight significant project logistics including identifying critical ocean transport.
- Develop and implement site communications, construction infrastructure, and water supply for an early and efficient startup. Ideally these are a subset of final installation.
- Plan to utilize early construction of ancillary facilities such as warehousing, dining facilities, emergency services facilities, and communication facilities for Temporary Construction Facilities. Coordination with KAM is required as many of the ancillary structures are KAM's responsibility as indicated in the Project Delivery Strategy.

- Develop and execute project control procedures and processes.
- Perform constructability reviews.
- Provide a Quality Plan.
- Implement project accounting and cost control best practices.
- Issue a cost control plan and a control budget including basis for any potential claims.
- Provide intended progress curves by area and trades.
- Oversee project accounting and relate to progress in billings.
- Mechanical completion, pre-commissioning and commissioning.
- Develop individual Health and Safety Plans that are comprehensive yet concise so that construction personnel, and the owner's team are safe during the field construction phase of the project. Quality Control for safety is by the various sub-contractors; Quality Assurance for safety is by the EPCM and EPC; Quality Review is by the Owner. These individual QA and QC plans must meet the Owner requirements stated in the master plan. (The Owner will provide an over-riding plan including emergency numbers, accident response plan, and accident reporting requirements.)

24.1.5 Project Management

KAM will be responsible for overall coordination. The EPC contractor will be responsible for management and control of the various project activities associated with the Process Plant and any other items assigned on an EPC basis. The EPCM contractor will be responsible for management and control of the remaining project construction activities. KAM will exercise ultimate control of the project by assigning a KAM Designated Project Manager to work in close cooperation with the Project Managers assigned by the EPC contractors and the EPCM contractors. The organizational chart is shown in Table 24-1.

24.1.5.1 Interaction

24.1.5.1.1 Owner's Responsibilities

The Owner's team will establish a project management system that will contribute to the overall cost reporting and scheduling for the project. A baseline estimate and comprehensive plan will be utilized to monitor project progress.

The Owner's team will also be responsible for the following activities:

- The most important task will be the development of detailed bid calls. Quality, schedule and cost issues must be fully addressed to avoid claims during construction.
- Mine planning and early-mine operations.
- Communication with local communities, First Nations, and the media.
- Establishing minimum project safety and health requirements (HASP).
- Incorporation of contractor monthly reports (including schedule updates) into Corporate Monthly Report.
- Monitor contractor procurement.
- Approving any cost reduction suggestions.
- Reviewing quality of construction.
- Work breakdown structure requirement document.
- Accounting and invoice payments, verification of requests against actual progress.

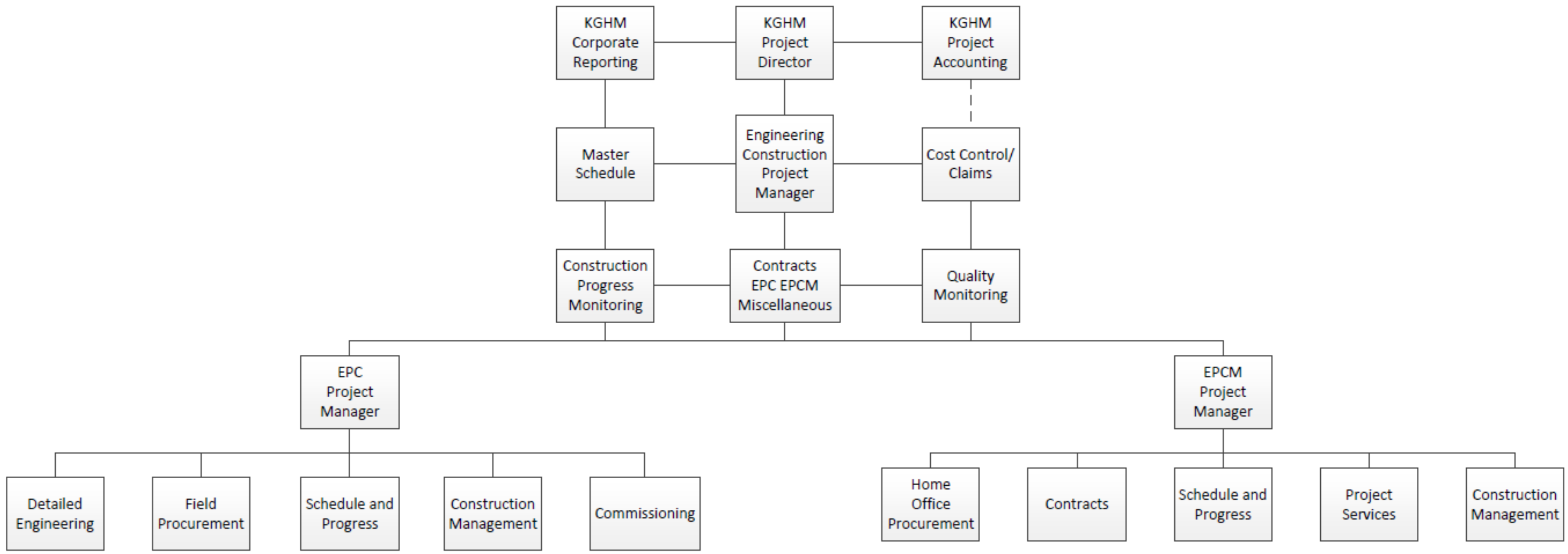
- Overall system interpretation of computer programming including commercial package.
- All permits or licenses required for construction, operation, and environmental compliance.
- Operation staffing, operator training, commissioning and start-up participation.
- Asset Register.

24.1.5.1.2 Contractors' Partnership with Owner

In addition to the aforementioned, Contractors are expected to invoice on a timely basis. To be valid, any claims must be within 30 days of pertinent transactions.

Upon request, Contractor internal procedures shall be made transparent to Owners' Team.

Table 24-1: EPCM Project Organization Block Diagram



24.1.6 Engineering

Some basic engineering was developed for the Project and its Permitting. Prior to completion, KAM will continue with internal means, a series of specific activities intended to complete confirmation of assumptions and considerations associated with the process plant, infrastructure including electrical power, and refinements to the water supply system.

24.1.7 Procurement

It is intended that the majority of mechanical and electrical equipment required for the project will be procured within North America. Concrete and building construction materials will be sourced primarily in Canada. Structural and miscellaneous steel, piping, tanks, electrical and miscellaneous equipment will be sourced within Canada and USA, and to the extent practical, within the region. The opportunity exists to source some items out of Asia.

Procurement will overlap Engineering as much as possible. Equipment and bulk material suppliers will be selected via a competitive bidding process. Similarly, construction contractors will be selected through a pre-qualification process followed by a competitive bidding process. It is envisaged that the project will employ a combination of lump sum and low unit price contracts as appropriate for the level of engineering and scope definition available at the time contracts are awarded.

Procurement of long delivery equipment and materials will be scheduled with their relevant engineering tasks. This will ensure that the applicable vendor information is incorporated into the design drawings and that the equipment will be delivered to site at the appropriate time and that it supports the overall project schedule. Particular emphasis will be placed on procuring equipment packages that could expedite delivery and optimize cost.

24.1.8 Construction Phase

Pending financing, the construction program is scheduled to start with general site preparation and construction of main access roads.

Approved contract *pro formas* will be utilized for construction and service contracts. Construction contractors will be responsible for:

- all construction labour
- all construction equipment
- worker transportation
- site offices and temporary services
- site management
- contractor surveying
- quality control
- contract scheduling
- safety
- environmental safeguarding and compliance
- security for their tools and equipment
- supply of permanent materials as required by contract.

The Owner, through the Engineering Construction Project Manager, will provide contractors with:

- on-site, project-wide first aid services
- project-wide security
- locations for offices and equipment/material lay down
- washroom and shower facilities; including portable toilet facilities
- local electrical panels and temporary generator sets for construction trailers only
- sources for water
- sources for all concrete and structural aggregates
- permanent bulk materials and all capital equipment
- audits of quality assurance and control
- waste management landfill
- supplier representative assistance.

24.1.8.1 Construction Management

Contractors are to enter into contractual agreements with KAM. The Owners' designee will act as overall construction contractor and will be responsible for management and control of the various construction activities, including those activities and functions assigned to sub-contractors.

24.1.8.2 Contracting

All work is to be competitively bid lump sum or on a low unit price basis. M3 has operated successfully with this paradigm for many projects.

Contracting is an integral function in the project's overall execution. Contracting for the Ajax Project will be done in full accord with the provisions of the overall EPC contract for the Process Plant and other items as identified as being good candidates, and EPCM contractor for the remaining work.

As to EPCM, a combination of vertical and horizontal contracts will be employed as best suits the work to be performed, degree of engineering and scope definition available at the time of award. A site installed concrete batch plant will supply concrete to all construction contractors.

In particular, the EPCM administered mass earthwork contract will cover all mine pre-stripping, clearing, grubbing, bulk excavation, and TSF preparation. This approach will result in economy of scale and eliminate interfacing issues which would arise if multiple contractors were employed. The contractor will require only one major mobilization for all work.

The Owner furnished construction camp will be utilized by all construction contractors. If required, each contractor will furnish their own construction camp and catering services. However, lodging and dining are anticipated to be in the city of Kamloops.

24.1.8.3 Quality Plan

Project specific Quality Plans will be developed and implemented on the site and satisfy the Owner's Quality Plan. The Quality Plan is a management tool, through the construction contractors, to maintain the quality of construction and installation on every aspect of the project. The plan, which consists of many different manuals and subcategories, will be developed during the engineering phase and available prior to the start of construction.

The Contractor Quality Plans must meet or exceed the requirements of the Owner's Quality Plan.

Failure to meet Quality Standards will require the items to be re-worked at no cost to KAM.

24.1.8.4 Construction Completion and Turn-over Procedure

The Construction Completion Procedure is part of the Construction Quality Plan. All contractual agreements shall include quality control of the work. Facilities will be verified and accepted in a stepwise, documented process of mechanical completion and pre-operational testing. Late apprehension of claims will be a basis for denial.

24.1.9 Labour and Training

The nearby communities of Kamloops, British Columbia will provide a significant part of the operation and construction labour. Additional labour will need to be transported from other, bigger population centers, Vancouver, B.C.

KAM - Ajax Project is in a mining area and there are people with operation and maintenance experience in the region. The recruitment effort will start in the area immediate to the project, three months prior to plant start-up. The opportunity exists to first employ a skilled operation contractor to delay training costs. That period is considered sufficient to evaluate the need for recruitment in an expanded area and also to assess the requirements for training.

In the Contract Mining Base Case, any required recruitment and training will be the responsibility of the mining contractor. For the Owner Mining Fleet Option, training of mining equipment personnel will be carried out with the help of equipment suppliers.

For plant operation and maintenance personnel, training could be provided by Canadian Mining Education and Training Institutions, or by contracted trainers hired by KAM - Ajax, or directly by KAM - Ajax personnel.

24.1.10 Project Health and Safety Plan

The Health and Safety Plan (HASP) will be established for the construction of the KAM - Ajax Project and any other authorized work at the project site. The HASP covers all contractor personnel working on the project and any other authorized work for the project. The Project HASP is in addition to Contractor Safety Plans and addresses overview issues such as emergency contact information.

The HASP specifies regulatory compliance requirements, training, certifications and medical requirements necessary to complete the project for Contractors. Along with the Operations Procedures, the HASP is to be followed by all Contractor personnel working at the site.

Individual Contractor HASP Plans must stratify the Project HASP.

24.1.11 Project Schedule

The Owners' designee will develop and maintain a common project schedule in consultation with Contractor and Owner efforts. The detailed schedule will follow the key milestone dates listed in Table 24-2.

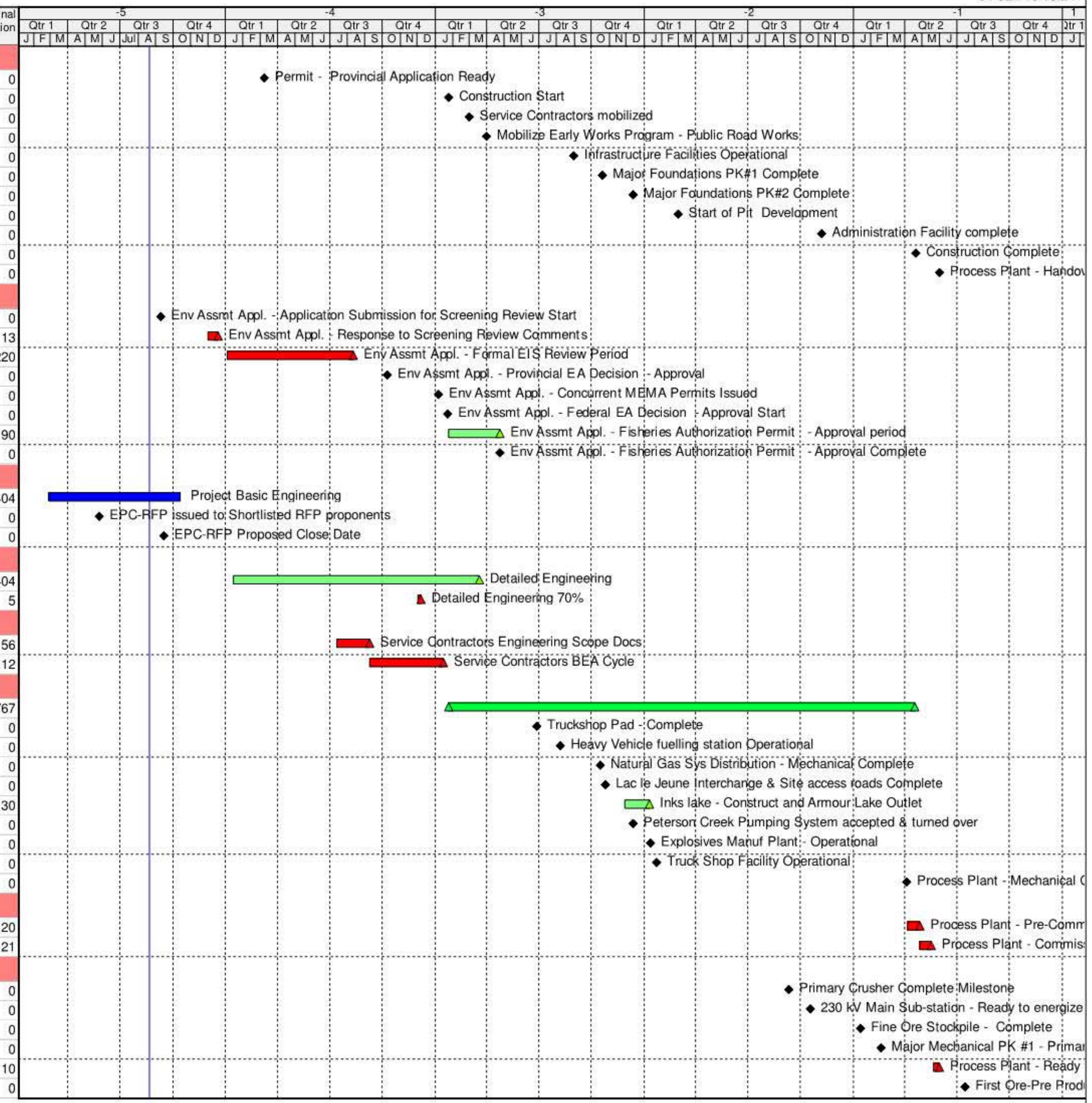
Table 24-2: AJAX Project Key Schedule Dates

Ajax Project Key Schedule Dates	Start	Finish
Ajax Project Basic Engineering Work (by Others)	Feb. 27, 2015	October 2015
EPC-RFP issued to shortlisted RFP Proponents		May 26, 2015
EA Application Submittal		September 10, 2015
EPC-RFP Proposal Close Date		Sept. 15, 2015
Receive Board Approval to Proceed		Year (-4)
Mobilize Engineering and Design	Year (–4)	
Commence Long Lead Procurement	TBD	
Engineering and Design 70% Complete		Q4 Year (-4)
MEMA/Construction Permits Issued		Year (-3)
Start Early Works Construction	Year (-3)	
Federal EA Decision		Year (-3)
Commence Concentrate Process Facilities Construction		Q2 Year (-3)
Engineering and Design Complete		Q1 Year (-3)
Construction Complete		Year (-1)
Pre-commissioning Complete		Q2 Year (-1)
Commissioning Complete		Q2 Year (-1)
First Ore-Pre-Production	Q3 Year (-1)	

A summary Project schedule is shown in Figure 24-1.

KGHM AJAX - Project Milestone Schedule — 04-Jan-16 18:24

Activity ID	Activity Name	Original Duration
Milestones		
A4380	Permit - Provincial Application Ready	0
39CZ012	Construction Start	0
39CZ008	Service Contractors mobilized	0
39CZ001	Mobilize Early Works Program - Public Road Works	0
39CZ010	Infrastructure Facilities Operational	0
39CZ015	Major Foundations PK#1 Complete	0
39CZ016	Major Foundations PK#2 Complete	0
39C6270K30	Start of Pit Development	0
39CZ026	Administration Facility complete	0
39CZ027	Construction Complete	0
39CK3810X100	Process Plant - Handover to Operations	0
Enviromental Assessment Application		
A1260	Env Assmt Appl. - Application Submission for Screening Review Start	0
A2320	Env Assmt Appl. - Response to Screening Review Comments	13
A2430	Env Assmt Appl. - Formal EIS Review Period	220
A2300	Env Assmt Appl. - Provincial EA Decision - Approval	0
A2290	Env Assmt Appl. - Concurrent MEMA Permits Issued	0
A1540	Env Assmt Appl. - Federal EA Decision - Approval Start	0
A2440	Env Assmt Appl. - Fisheries Authorization Permit - Approval period	90
A2450	Env Assmt Appl. - Fisheries Authorization Permit - Approval Complete	0
Basic Engineering		
39CZ97	Project Basic Engineering	404
ISM100	EPC-RFP issued to Shortlisted RFP proponents	0
ISM140	EPC-RFP Proposed Close Date	0
Detailed Engineering		
39CZ57	Detailed Engineering	404
CTEN1070	Detailed Engineering 70%	5
Construction Contracts		
39CZ27	Service Contractors Engineering Scope Docs	56
39CZ37	Service Contractors BEA Cycle	112
Construction		
39CZ107	Construction Summary	767
39CZ007	Truckshop Pad - Complete	0
39C1420K70	Heavy Vehicle fuelling station Operational	0
39C4810K08	Natural Gas Sys Distribution - Mechanical Complete	0
39C6270K09	Lac le Jeune Interchange & Site access roads Complete	0
39C6271EX66	Inks lake - Construct and Armour Lake Outlet	30
39C5610K17	Peterson Creek Pumping System accepted & turned over	0
39C1610K144	Explosives Manuf Plant - Operational	0
39C1410K26	Truck Shop Facility Operational	0
39CC3810K22	Process Plant - Mechanical Complete	0
Pre-Commissioning / Commissioning		
39CK3810X13	Process Plant - Pre-Commissioning	20
39CK3810X80	Process Plant - Commissioning	21
Operations		
39CZ020	Primary Crusher Complete Milestone	0
39C6410K20	230 kV Main Sub-station - Ready to energize	0
39CZ021	Fine Ore Stockpile - Complete	0
39C2510K53	Major Mechanical PK #1 - Primary Crushing & Conveying Complete	0
39CK3810X90	Process Plant - Ready for Turnover to Operations	10
39CK3810X101	First Ore-Pre Production	0



Remaining Level of Effort | Remaining Work | Mile... | Actual Work | Critical Remaining Work

Page 1 of 1

Ajax KGHM Project Milestone Schedule

TASK filter: Sort Milestones.

Figure 24-1: Project Schedule

24.1.12 Commissioning and Start-up

The Commissioning and Start-up Plan will be developed during detail engineering of the project. After mechanical completion, pre-operational testing (pre-commissioning), and commissioning, the project will be turned over to KAM for start-up.

25 Interpretation and Conclusions

25.1 General Conclusions

General conclusions of the technical studies performed and described in this report are the Ajax project is economically and technically viable. Evaluations of the orebody, environmental aspects, and ore processing appear to be technically sound based on the assumptions of this report.

25.2 Mine Development

The requirements for infrastructure, workforce, and power, water and communication facilities to support future mining operations are well understood, and the understanding is sufficient to support Mineral Resource and Mineral Reserve declaration. There is sufficient area within the Ajax ground holdings to support development of an open pit. Additional ground that hosts the TSF is held through an agreement completed in 2014. It is a reasonable expectation that appropriate surface rights to support project development and operations can be obtained, and therefore declaration of Mineral Resources and Mineral Reserves can be supported. It is expected that any future mining operations will be able to be conducted year-round.

In the opinion of the QP, knowledge of the deposit settings, lithologies, and structural and alteration controls on mineralization is sufficient to support Mineral Resource and Mineral Reserve estimation. The exploration programs completed to date are appropriate to the style of the deposits and prospects within the project. Additional exploration potential remains in the project area.

From the review of the drill programs, the QP concluded that documentation for the drilling campaigns completed in the Ajax area before 1981 is limited or not available. Because of the limited documentation, the pre-1981 drill campaigns were not included in the 2015 resource model database. No factors were identified with the data collection from the drill programs used that could materially affect the quality of the Mineral Resource or Mineral Reserve estimation. The Ajax deposits have been sampled at drill hole spacing appropriate for a property at this level of development. Because of the irregular shape of the mineralized body, the orientation of the mineralization with respect to drill intercepts is not well-understood.

In the opinion of the QP, sample collection, preparation, analytical and QA/QC data from the Abacus and KGHM drilling programs were appropriate and meet industry standards. The QP concludes that the analytical data can be used to support Mineral Resource and Mineral Reserve estimation without limitation. Because of the lack of information for Afton OC and Cominco drilling, AMEC previously compared these drill campaigns to the previous Abacus drilling using paired samples. AMEC concluded that model blocks with grade estimates primarily supported by Afton OC drilling should be limited to an Indicated classification. Model blocks with grade estimates primarily supported by Cominco drilling were limited to an Inferred classification. Recent drilling has provided additional data for some areas of the block model where the resource classification has been adjusted.

The QP considers that a reasonable level of verification has been completed, including evaluations conducted by AMEC and KAM technical staff and reviewed by MDA in 2014 and AMC Mining Consultants (Canada) Ltd., based in Vancouver in January 2015, and that no material issues would have been left unidentified from the audit programs undertaken. The data verification programs undertaken on the data collected from the project adequately support the geological interpretations, the analytical and database quality, and therefore support the use of the data in Mineral Resource estimation.

In the opinion of the QP, estimations of Mineral Resources for the project conform to industry best practices, and meet the requirements National Instrument 43-101 Standards of Disclosure for Mineral Projects. An LG pit shell has been used to constrain the mineral resource estimate. Measured and Indicated Mineral Resources total 568 Mt grading 0.28% Cu and 0.18 g/t Au. In addition, there are 29 Mt in the Inferred category, grading 0.13% Cu and 0.09 g/t Au.

Factors that may affect the geological models or the pit shells used to constrain the mineral resources, and therefore the Mineral Resource estimates include: the commodity price assumptions; the NSR value used to constrain the Mineral Resources is based on technical and economic parameters determined the Ajax 2015 mine planning process, should these assumptions change, then the pit constraining the Mineral Resources will also change; metallurgical recovery assumptions; pit slope angles used to constrain the estimates; and the SG values assumed for the rock types.

An economic pit design has been used to constrain the estimate, and appropriate modifying factors have been applied to convert Measured and Indicated Mineral Resources to Mineral Reserves. The Proven and Probable Mineral Reserves total 426 Mt grading 0.29% Cu, and 0.19 g/t Au, and 0.39 g/t Ag at a US$7.10 NSR cut-off.

Factors that may affect the Mineral Reserve estimate include the ability to relocate the Kinder Morgan Canada's Trans Mountain Pipeline, development of the Peterson Creek diversion and Jacko Lake containment, effectiveness of surface and groundwater management, effectiveness of the dilution model, estimated mining loss assumption, copper, gold, and silver price assumptions, metallurgical recoveries, geotechnical characteristics of the rock mass (unrecognized structural complications in areas with relatively low drill hole density could introduce unfavourable pit slope stability conditions), ability of the mining operation to meet the planned annual throughput rate assumptions for the process plant, capital and operating cost estimates, the assumption that granting of appropriate environmental and construction permits would be forthcoming from the relevant authorities, unrecognized structural complications in areas with relatively low drill hole density, and accuracy of the Resource block model and geological interpretation.

The proposed mine plan has been developed to send 65,000 t/d of ore to the processing facility. The average head grade of process feed for the life-of-mine is 0.29% Cu, 0.39 g/t Ag, and 0.19 g/t Au. Mining will be accomplished using a conventional truck and shovel operation, with crushing and conveying. The proposed mine has an expected mine life of 18 years, and an overall stripping ratio of 2.65:1 waste to ore.

25.3 Processing Plant Design

The Ajax concentrator has been designed to produce a saleable copper concentrate. The complete processing circuit has been designed according to metallurgical testwork conducted over the years and proven equipment.

The flowsheet development for the processing of Ajax ore is considered as straightforward and proven technology. Anticipated recovery is considered viable by this process scheme and typical for this type of ore body. Equipment selection is considered standard by the mining industry.

25.4 Tailings Storage Facility Design

Norwest developed the Basic Engineering level tailings management design incorporating new metallurgical testwork results on the dewatering and rheological properties of the tailings along with results from the geotechnical investigations completed in 2014 and 2015. The TSF is designed to permanently store approximately 440 million tonnes of tailings generated during the life of mine. The TSF will be comprised of four earth-rockfill dams: north, east, south and southeast embankments in order to contain tailings and supernatant water. The north and east embankments will be buttressed by mine rock storage facilities constructed against the downstream slopes of the TSF, which are incorporated in the embankment designs from start-up and throughout the life of the facility.

The tailings stream will be a thickened, non-segregating slurry discharged into an external TSF constructed for the Ajax operations. The TSF main components will consist of a buttressed embankment containment structure, a tailings storage basin and associated supernatant pond.

The flotation tailings pumped from the concentrator will be thickened using flocculants before being pumped to the tailing storage facility. Thickener overflow water and TSF reclaim water will be piped to the process water tank for reuse in the milling process.

The TSF has a cross-valley fill configuration and will be constructed in a downstream manner and thickened tailings will be discharged from spigot points. Mine rock from the open pit will be used to construct tailing storage facility embankments and associated buttresses. The TSF will incorporate seepage control zones on its upstream face comprising compacted low permeability fill from local borrow sources.

At closure, the reclamation of the tailings storage facility will consist of a closure dry cover placed over the entire tailings surface area. The water in the TSF supernatant pond will be pumped to the open pit until discharge requirements are met and a stable trend in water chemistry is attained. An excavated channel to the east is planned for construction to allow the reclaimed surface to be free draining with runoff flowing to a nearby stream.

Studies have determined the tailings to be non-acid generating. Non-acid generating mine rock will be utilized for the TSF embankment construction.

25.5 Environmental Studies, Permitting and Social or Community Impact

The Project has been subject to environmental and social studies covering different aspects relevant to the Project, including an environmental assessment under federal and provincial legislation that is currently underway. The Application/EIS was submitted for screening/conformity review in September 2015 and was subsequently determined as being complete by both the EAO and the CEA Agency. At the time of writing, KAM was finalizing the Application/EIS to reflect clarifications and additional information provided during the screening period and is targeting submission of the updated Application/EIS for detailed review to commence in January 2016. Permit/authorizations under provincial and federal legislative instruments will be prepared in parallel with the Application/EIS and submitted during the review of the Application/EIS. The timeline for regulatory approvals is inherently uncertain.

Through comprehensive environmental assessment studies, KAM and its team have systematically identified issues of concern; scoped potential sources of effects and effects mechanisms and evaluated their potential to affect environmental, social, heritage, and health Valued Components (VCs); and assessed the capacity of various mitigation measures to prevent effects or, where not possible, to reduce them to acceptable levels. With mitigation measures applied, KAM's team of experts has then determined the residual effects on the project setting, and whether or not these residual effects are significant. The project is subject to review and approval by both the federal and provincial governments in order to proceed to development. It is through these public processes that the environmental and social feasibility of the project will ultimately be determined.

The Ajax project's proximity to Kamloops and location within the traditional territories of several Aboriginal groups means heightened interest and concern over land uses such as mining. These public perceptions of the project have affected how the project has been developed to date, and may affect how the project passes through the EA process. Core to completing the environment assessment, permitting activities, and overall project planning and design has been the engagement and consultation with community members, local residents, stakeholders, interest groups, land users, local governments and regional planning district, and provincial and federal government agencies. In addition focused engagement and consultation activities have been completed for Aboriginal Groups.

If external groups continue to feel that their concerns regarding the project have not been addressed, there is a possibility that they could escalate to legal challenges to the project through the court system or procedural challenges through the EA process. Managing these legal or procedural challenges – if they materialized – could require a significant commitment of time and legal expertise. KAM through the Application/EIS and permitting processed will continue to engage and consult with interested parties and stakeholders to share information, develop and implement mitigation measures in a collaborative manner, and address any issues/concerns. This will reduce the risk to the project advancing through regulatory review and permitting.

KAM has been actively consulting Aboriginal groups under the EA process, as well as conducting dialogue with a view toward reaching an agreement that considers impacts to Aboriginal rights of, and provides benefits to, the SSN (an "impact-benefit agreement"). The SSN has informed KAM that this area has spiritual, cultural, and historical importance to them; the SSN has cited effects of historic mining activity on this area as the reason why they are concerned about the Ajax project. In June of 2015, the SSN declared Aboriginal title over Pípsell which is composed of Jacko Lake and surrounding area. If the courts find that the SSN's claim has merit, there are potential implications for the SSN's ability to allow or deny mining to take place in this area. It is not immediately clear when a legal decision will be reached. It is also not immediately clear whether SSN would intend to block mining if its title is recognized. The SSN claim to Aboriginal title over Pípsell underscores the need for KAM to reach a negotiated agreement with SSN that provides assurance to both parties that the project is welcomed and mutually beneficial. The cost of delays or changes to project design (such as a reduction in pit limits to avoid impacts to Jacko Lake) has not been incorporated into the financial analysis presented in this technical report.

The SSN is, in parallel with the EA Process, conducting their own assessment process that respects the SSN cultural perspectives, knowledge and history. KAM intends to participate in the SSN Assessment Process by considering and responding to SSN's perspectives, opinions and technical information, including that which may result from the SSN Assessment Process.

Final mine closure will occur when either all mineable and economic mineral reserves have been exhausted or if a commercial decision is made by KAM management to permanently cease operation. An important consideration of final closure is the effect of mine closure on employees, contractors and suppliers and the public. It is KAM's aim to plan for closure so that adequate notice (if possible, in the order of a year or more) can be given to employees and the public.

The preliminary closure plan developed to support the Application/EIS and associated cost estimate of **$195 million** Canadian dollars is based on third party implementation and completion of the closure plan measures as required for British Columbia government. Ongoing project design and planning will refine this estimate to provide a more detailed estimate to support permit applications and initiate discussions with the government agencies.

For the purposes of the Feasibility Study Update, a closure and reclamation cost estimate was developed by KAM using the State of Nevada Reclamation and Closure Cost Estimator (SRCE). The SCRE has been adopted by KAM for use across its assets in estimating closure and reclamation costs. Unlike the estimate provided for the Application/EIS, the SCRE is based on an assumption that the work is undertaken by the owner, KAM, and not a third-party. This estimate has not been reviewed in detail by ERM.

25.6 Risks and Opportunities

There are a great many inherent risks in large mining projects. The body of this report addresses many of these details and assumption which were considered in the technical report appraisal.

A unique set of Ajax risk and opportunity set involve the economic climate at the timing of this report. Universal commodity pricing are at very low levels. The mining industry is in a period of retrenchment as the supply and demand in the products produced by the natural resource industry are in a state of imbalance. This imbalance results in both a large risk and opportunity for KAM.

The risk is that copper and metal pricing remain at current levels for many years. It seems unlikely that the global economy will remain stagnant for such an extended period, and normal pricing cycles will return to levels observed in the past few years. The timing of the economic situation could be very favorable to KAM, as production of product would not be expected for 3 – 4 years through the construction period, yet expedient project execution could take advantage of favorable pricing and reduced capital costs in this period. Key risk and opportunities are reflected in the sections below.

25.6.1 Project Risks

- The risk of an extended metals price downturn could render the project at an economic disadvantage.
- Delays and challenges in the environmental process.
- Increases in commodity pricing could increase unit pricing in construction costs.

25.6.2 Project Opportunity

- Purchasing of major equipment as preferred vendor packages could potentially reduce capital equipment costs.
- Recent low metal and commodity pricing has resulted in a reduced number of active projects. The availability of mining and processing equipment and associated terms and conditions for construction and installation of that equipment is very favourable at present.

26 Recommendations

26.1 General Recommendation

This technical study concludes that the Ajax Project is economically viable as presented in this report, and beneficial project for its stakeholders. It is recommended that this project be advanced to the next stages of environmental approval process, and the detailed engineering phase.

Multiple opportunities have been identified which may enhance the economics and provide positive potential during a successful project execution. Some of these opportunities are discussed in the sections below as recommendations for future study.

26.2 Geology and Mining

The pit design is based on the assumption that the Kinder Morgan Canada's Trans Mountain Pipeline will be relocated. A detailed relocation plan of this pipe is needed as soon as possible in order to advance the project into the detailed engineering phase.

The following work should be conducted during the detailed engineering phase:

- There is a reasonable likelihood that high-grade mineralization plunges to the north or northwest in structurally controlled shoots. Efforts should be made to test potential shoots with targeted drilling in the West Pit, Saddle, East Pit and NE Extension areas.
- The NE Extension remains open to the northeast, though the potential is diminished somewhat by increasing depth. There is space for mineralization to come closer to surface further to the southeast.
- Mineralization in the southeast quadrant is defined by the widely-spaced drilling and there is significant potential to locate additional mineral resources within the proposed pit shell. Host SLD is known to extend to the east-southeast beyond the pit shell.
- Incorporate 2015 drilling program results in the block model
- Conduct dilution and bench height study
- Review support equipment number and type
- Review the phase designs and pit schedule to try and further advance the phases in the west in order to maximize the backfill capacity.
- Review drill sizing/ requirements
- Review the explosive type used in waste rock
- Complete an autonomous drilling study
- Complete an autonomous trucking study
- Review organizational chart
- Update Mine Plan with the latest parameters

26.3 Processing

26.3.1 Regrind Mill Selection

The primary regrind mill is currently designed to be a Vertimill. The choice of a Vertimill rather than an IsaMill should be revisited in detailed engineering due to the potential reduction in gravity gold recovery. The trade-off study should be revised to reflect the lower gold recovery to determine if the reduction in recovery changes the decision to purchase and install the Vertimill. Revisiting this trade-off study should be completed prior to the commencement of detailed engineering to assure a frozen scope for detailed engineering.

26.3.2 Tailings Thickener

The current tailings circuit design includes one, elevated, tailings thickener. A trade-off study should be performed prior to detail engineering to evaluate whether in-ground or elevated design/construction of the thickener is most cost effective. Additionally, a trade-off study should be completed if one verses two thickeners is the best design for the project. Both trade-off studies should be completed prior to the start of detailed engineering.

26.3.3 Other Considerations

The following items should be reviewed before or at start of detailed engineering:

- Confirmation of Ball mill sizing and power requirements at 65K tpd
- Cone crusher screen size/ capacity versus availability of the secondary crushing circuit
- Pump box residence time and capacity
- Concentrate storage area with moving of concentrate by loader to trucks, is there enough working area, and further review if a truck scale should be added back into the area
- Ore flow characteristics through stockpiles and bins need to be reviewed
- Piping detail should be reviewed.
- Mass balance from Basic Engineering should be reviewed
- Trade Off Study (TOS) for one filter versus two filters
- Power load from Basic Engineering should be reviewed

26.4 Overall Site Infrastructure

26.4.1 Fresh Water Supply

The technology selected for pump selection at the Kamloops Lake intake pumps and structure should be revisited. The challenges associated with the existing intake structure have been overcome in the basic engineering design with suction created by the pumps in the wet well and piping the intake water directly to the pump intake thus eliminating the wet well. This technology should be revisited in detailed engineering and other options evaluated.

26.4.2 Geotechnical conditions

Additional investigation is required in specific areas, including the truckshop area, where no subsurface data are available; the access road alignment, where typical conditions have been inferred from test holes in the general area, a possible borrow source for structural fill; Jacko Lake where additional geotechnical information is required for design of the embankments; and, specific equipment footprints (i.e., ball mills, crushers, etc.), in the plant site area, where drill holes are required beneath critical equipment once the locations have been finalized. Availability/economics of the use of local construction material sources for fill, aggregates, riprap and low permeability liner should be evaluated in greater detail for the various construction areas.

26.4.3 Logistics

A logistics study will be completed in order to confirm shipping restrictions (dimensions and loads) for use in the next phase of the project. Shipping limits have a direct impact in major equipment cost, installation and assembly costs.

26.5 Environmental

Project approvals and permitting are often on a projects critical path for development and are inherently uncertain. The Application/EIS for the Ajax project was submitted in September 2015 and was determined to be complete by the federal and provincial governments in November 2015. Detailed review of the Application/EIS is anticipated to commence in January 2016. It is recommended that KAM continue to proactively engage with regulators, local/provincial/federal representatives, stakeholders, industry members, residents, Aboriginal groups, community members and other land users to share information and address issues and concerns. This will reduce the risk to the project advancing through regulatory review and permitting. The preparation and submission of permit applications should continue in earnest in order to support the timely receipt of approvals.

The SSN claim to Aboriginal title over Pípsell underscores the need for KAM to reach a negotiated agreement with SSN that provides assurance to both parties that the project is welcomed and mutually beneficial. It is recommended that KAM continue to actively pursue an agreement with SSN in a timely manner to in order to reduce project risk and uncertainty. The costs associated with such an agreement, if reached, will need to continue to be considered in the financial analysis of the project.

Certain mitigation measures have been identified by the project to reduce the potential for adverse environmental effects and maximize positive benefits. The need for further environmental studies has also been identified to support on-going project planning and project permitting. It is recommended that this work continue to be advanced as regulatory review of the project proceeds and is undertaken in parallel with detailed engineering. This work will require engineering support and includes the development of detailed compensation plans for environmental effects resulting from the project including compensation for impacts to fisheries and wetlands.

As part of detailed engineering, KAM should continue to advance its closure and reclamation plan for the project as an integrated element of the mine plan. Cost estimates should continue to be refined to validate the estimates completed for and presented in this technical report.

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- KA39-6610-10-504 Incoming Fresh Water Pipeline, Booster Pump Station#2 to Plant Site, Plan & Profile – Sheet 1
- KA39-6610-10-505 Incoming Fresh Water Pipeline, Booster Pump Station#2 to Plant Site, Plan & Profile – Sheet 2
- KA39-6610-10-506 Incoming Fresh Water Pipeline, Booster Pump Station#2 to Plant Site, Plan & Profile – Sheet 3
- KA39-6610-10-507 Incoming Fresh Water Pipeline, Booster Pump Station#2 to Plant Site, Plan & Profile – Sheet 4
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Appendix A: Feasibility Study Contributors and Professional Qualifications

CERTIFICATE of QUALIFIED PERSON

I, Keith D Dagel, PE, do hereby certify that:

1. I am currently employed as an Engineer and Project Manager by:

   M3 Engineering and Technology
   2051 W Sunset Road
   Tucson, AZ 85704

2. I have a Bachelor of Science Degree in Environmental Engineering from Montana College of Mineral Science and Technology, Butte, MT. May 1979.

3. I am a:

   - Registered Professional Engineer (Mining) in the State of Nevada (License No. 11284).

4. I have thirty six years of experience in the mining industry specializing in ore processing operations and project management.

5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the Sections 1.1, 1.8.1, 1.8.2 1.9, 1.11, 1.12, 1.13, 1.14, 2, 3, 18.3.11, 18.3.13, 18.5.1 to 18.5.3, 18.7, 18.8, 19, 21.3 (except 21.3.1), 21.4 (except 21.4.1), 21.5, 21.6, 22, 25.1, 25.3, 25.6, 26.1, 26.3, 26.4, and 27 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

7. I have had prior involvement with the property that is the subject of the Technical Report. In 2015, I participated in a Technical Study to evaluate filtered versus conventional tailings. In the same year, I participated in a third party technical review of the basic engineering phase.

8. I have visited the Ajax Project Site on March 17, 2015.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

(Signed) (Sealed) "Keith D. Dagel"
Signature of Qualified Person

Keith D. Dagel, PE
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Daniel K. Roth, PE, P.Eng., do hereby certify that:

1. I am currently employed as a project manager and civil engineer at M3 Engineering & Technology Corporation located at 2051 West Sunset Rd, Suite 101, Tucson, AZ 85704.
2. I graduated with a Bachelor's of Science degree in Civil Engineering from The University of Manitoba in 1990.
3. I am a registered professional engineer in good standing in the following jurisdictions:
   - British Columbia, Canada (No. 38037)
   - Alberta, Canada (No. 62310)
   - Ontario, Canada (No. 100156213)
   - Yukon, Canada (No. 1998)
   - New Mexico, USA (No. 17342)
   - Arizona, USA (No. 37319)
   - Alaska, USA (No.102317)
4. I have practiced engineering and project management for 25 years. I joined M3 Engineering in November 2003.
5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the Sections 21.1, 21.2 (except 21.2.5) and 24 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).
7. I have not had prior involvement with the property that is the subject of the Technical Report.
8. I have visited the Ajax Project Site on March 17, 2015.
9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.
10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.
11. I have read National Instrument 43-101 and Form 43-101F1, and the parts of the Technical Report for which I am responsible have been prepared in compliance with that instrument and form.
12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

(Signed) (Sealed) "*Daniel K. Roth*"
Signature of Qualified Person

Daniel K. Roth, PE, P.Eng.
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Sean Ennis, do hereby certify that:

1. I am currently employed as a Vice President, Mining by:

   Norwest Corporation, Suite 1830 – 1066 West Hastings St. Vancouver, BC. V6E 3X2

2. I am a graduate of the University of Alberta with a Bachelor of Science degree in Mining Engineering (1991) and with a Master's of Engineering Degree in Geo-environmental Engineering (1997).

3. I am a member of the Association of Professional Engineers and Geoscientists of British Columbia, (Member #24279) and the Association of Professional Engineers and Geoscientists of Alberta, (Member #M52576). I am also registered as a P.E. in the United States (Washington, New Mexico).

4. I have worked as a mining engineer for 21 years. My experience has included working at coal, base and precious metals, and oil sands operations. I have been involved in the evaluation and design of mine waste structures for numerous projects from initial screening studies through permit level and into construction and operational support. I have worked both on the design of mine waste structures for projects within Canada and on international projects.

5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the Sections 1.8.3, 1.8.4, 5.3, 5.4, 16.2.1, 18.2, 18.3 (except 18.3.11, 18.3.13), and 25.4 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

7. I have not had prior involvement with the property that is the subject of the Technical Report.

8. I visited the Ajax Project site on October 19, 2015.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the sections of the Technical Report for which I am responsible have been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

(Signed) (Sealed) "*Sean Ennis*"
Signature of Qualified Person

Sean Ennis, P. Eng.
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Danny Tolmer P.Eng., do hereby certify that:

1. I am currently employed as a Senior Mining Engineer at:
   Golder Associates Ltd.
   2920 Virtual Way
   Vancouver, British Columbia
   Canada V5M 0C4

2. This certificate applies to the technical report entitled Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

3. I am a graduate of the University of British Columbia (B.A.Sc., 2004). I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia, License #33590. I have over 12 years of experience with open pit mine operation and design. I have conducted economic studies, prepared both long and short term schedules, and have done due diligence studies on a number of mining projects.

4. I have read the definition of "Qualified Person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.

5. I am responsible for the Sections 1.5, 1.6, 15 (excluding 15.1.2.5), 16 (excluding 16.2.1), 21.2.5, 21.3.1 and 21.4.1 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

6. I have no prior involvement with the property that is the subject of the Technical Report.

7. I have visited the Ajax Project Site for half of one day on May 4, 2015.

8. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

9. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

10. I have read National Instrument 43-101 and Form 43-101F1, and the sections of the Technical Report for which I am responsible and they have been prepared in compliance with that instrument and form.

Signed and dated this 19th day of February, 2016.

"Original document signed and sealed by Danny Tolmer P.Eng."
Signature of Qualified Person

Danny Tolmer, P.Eng
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Derek Christopher Chubb, do hereby certify that:

1. I am currently employed as a Senior Partner by:

   ERM Consultants Canada Ltd., Suite 2050, 3300 Bloor Street West, Toronto, Ontario, Canada M8X 2X2

2. I graduated from McMaster University in 1990 with a Bachelor in Chemical Engineering.

3. I am a:
   - Registered Professional Engineer in the Province of Ontario (Reg. 90328121)

4. I have worked in the field of environmental management for a total of 23 years since my graduation. My relevant experience for this Technical Report is:
   a. Review and report as a consultant to numerous operations and projects on matters related to environmental and socio-economic management
   b. Management of the design and implementation of environmental and socio-economic baseline data programs, regulatory submissions including EIS documents, and project permitting support
   c. Senior management roles with accountability for environmental affairs at several mining companies including the VP Sustainability for a company seeking to develop a project in Nunavut.

5. I have read the definition of “qualified person” set out in National instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.

6. I am responsible for the Sections 1.10, 4.5, 20, 25.5, and 26.5 of the technical report titled “Ajax Project, NI 43-101 Technical Report, Feasibility Study Update” (the “Technical Report”), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

7. I have had prior involvement with the property that is the subject of the Technical Report. My involvement has been to oversee consulting services provided by ERM Consultants Canada to KAM as it relates to the coordination of the undertaking of archaeological studies, and the assembly of the EIS/Application.

8. I have not visited the Ajax Project Site.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

(Signed) (Sealed) “Derek Christopher Chubb”
Signature of Qualified Person

Derek Christopher Chubb, P. Eng.
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, CHRISTOPHER J. WILD, P.Eng, do hereby certify that:

1. I am currently employed as Chief Geologist and Mine Manager at Ajax by:

   KGHM Ajax Mining Inc., 124 Seymour Street, Kamloops, BC., V2C 2E1

1. I am a graduate of the University of British Columbia with a Bachelor of Applied Science – Mineral Exploration Option (1984).
2. I am a Registered Professional Engineer in the Province of British Columbia (Registration No. 21102)
3. I have practiced geological engineering focusing on mineral exploration and mineral deposit geology continuously since 1985.
4. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I am responsible for the Sections 1.2, 1.3, 1.4, 4 (except 4.5), 5.5, 6, 7, 8, 9, 10, 11, 12, 14, 23, 25.2 and 26.2 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).
6. I have been employed as Chief Geologist at Ajax since December 2013 and had no prior involvement with the property that is the subject of the Technical Report.
7. I have visited the Ajax Project Site on January 14, 2016.
8. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.
9. I am not independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.
10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report parts I am responsible for have been prepared in compliance with that instrument and form.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

(Signed) (Sealed) "*Christopher J. Wild*"
Signature of Qualified Person

Christopher J. Wild, P.Eng.
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Claus Stoiber, do hereby certify that:

1. I am currently employed as an Engineer and Mineral Processing Manager by:

   KGHM – Robinson Holdings Ltd.
   Suite 202 – 8105 Birch Bay Square St.
   Blaine, WA 98230-9802

2. I am a graduate of the Montana Tech of the University of Montana with a degree in Metallurgical Engineering.

3. I am a:

   - Registered Professional Engineer in the State of Utah, USA

4. I have practiced engineering at Newmont Mining, Kennecott Utah Copper, and KGHM for 25 years.

5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the Section 13 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

7. I have had prior involvement with the property that is the subject of the Technical Report. I managed the metallurgical test programs in 2014 and 2015.

8. I last visited the Ajax Project Site on April 23, 2015.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

(Signed) (Sealed) "*Claus Stoiber*"
Signature of Qualified Person

Claus Stoiber, PE
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, JULIAN MATTHEW WATSON, do hereby certify that:

1. I am currently employed as a Corporate Senior Manager, Geotechnical Engineer and Hydrology by:

   Robinson Holdings (USA) Ltd. (a Subsidiary of KGHM); 8105 Birch Bay Square Street, Suite 202, Blaine, WA 98230-9802 USA

2. I am a graduate of Monash University in 1999 with a Bachelor of Science (Honors) in Geology, and of the University of New South Wales in 2009 with a Masters of Mining Engineering (Mining Geomechanics).

3. I am a:

   - Registered Professional Engineer in the State of Queensland (RPEQ) of Australia (Reg. 11060)
   - Registered Professional Member of Australasian Institute of Mining and Metallurgy (AusIMM) (Reg. 991137)

4. I have practiced geotechnical engineering for 15 years. My relevant experience for this Technical Report including:

   - Project and operations: preliminary economic evaluations to detailed design and operations.
   - Mining methods: open pit and underground mining methods.
   - Mine Design: drill hole design, data collection, interpretation, and design of open pit and underground mines. Application of analytical, empirical, and numerical methods.
   - Due diligence: performed on various open pit and underground acquisition targets.

5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the Section 15.1.2.5 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

7. I have had prior involvement with the property that is the subject of the Technical Report. I provide overview and guidance with geotechnical assessments associated with the proposed Ajax Project open pit design.

8. I have visited the Ajax Project Site on 14 to 17 December 2015.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the parts of the Technical Report for which I am responsible have been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

(Signed) (Sealed) "*Julian Watson*"
Signature of Qualified Person

Julian Watson
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Jian (James) Yue, do hereby certify that:

1. I am currently employed as a Principal Process Engineer by:

   Fluor Canada Ltd. Suite 700, 1075 W. Georgia St. Vancouver, B.C. V6E 4M7 Canada

2. I am a graduate of the University of British Columbia as a Master of Applied Science in November 2003
3. I am a:
   - Registered Professional Engineer in the Province of British Columbia
4. I have practiced engineering at both Canada and China
5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the Sections 1.7 and 17 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).
7. I have not had prior involvement with the property that is the subject of the Technical Report.
8. I have visited the Ajax Project Site on February 10, 2016.
9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.
10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.
11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

(Signed) (Sealed) "*Jian (James) Yue*"
Signature of Qualified Person

Jian (James) Yue, PE, E.Eng
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Emir Mehmedbegovic do hereby certify that:

1. I am currently employed as an Engineer by:

   Fluor Canada Ltd, at 700-1075 West Georgia Str, Vancouver, BC, Canada V6E 4M7

2. I am a graduate of the University of Sarajevo

3. I am a:

   - Registered Professional Engineer in the Province of British Columbia, Canada

4. I have practiced engineering for 12 years

5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the Sections 5.1, 5.2, 18.1, 18.5.4, 18.5.5 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

7. I have had prior involvement with the property that is the subject of the Technical Report. I acted as a lead engineer for my specific area of responsibility during the two past phases of the project, the Feasibility Study Update phase from September 2014 to December 2014 and the Basic Engineering phase, from March 2015 to October 2015

8. I have visited the Ajax Project Site on Sep 18, 2015.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

Signature of Qualified Person — Seal

Emir Mehmedbegovic
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Peyman Rahmatian, do hereby certify that:

1. I am currently employed as an Engineer by:

   Fluor Canada Ltd, at 700-1075 West Georgia Str, Vancouver, BC, Canada V6E 4M7

2. I am a graduate of the University of British Columbia (M.A.Sc.)

3. I am a:

   - Registered Professional Engineer in the Province of British Columbia, Canada

4. I have practiced engineering at Fluor Canada Ltd for 18 years

5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for Section 18.4 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

7. I have had prior involvement with the property that is the subject of the Technical Report. I acted as a lead engineer for my specific area of responsibility during the past phase of the project, the Basic Engineering phase, from March 2015 to October 2015

8. I have visited the Ajax Project Site on February 10, 2016.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

____
Signature of Qualified Person

Peyman Rahmatian
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Maz Laylabadi, do hereby certify that:

1. I am currently employed as an Electrical Engineer by:

   Fluor Canada Ltd, at 700-1075 West Georgia Str, Vancouver, BC, Canada V6E 4M7

2. I am a graduate of the University of New Brunswick, Masters of Science in Electrical Engineering.

3. I am a:

   - Registered Professional Engineer in the Province of British Columbia, Canada

4. I have practiced engineering for 14 years

5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for the Section 18.6 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

7. I acted as a lead electrical engineer for my specific area of responsibility during the two past phases of the project, the Feasibility Study Update phase from September 2014 to December 2014 and the Basic Engineering phase, from March 2015 to October 2015

8. I have not visited the Ajax Project Site.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA M. B. LAYLABADI # 31842

Signature of Qualified Person [Seal]

Maz Laylabadi
Print name of Qualified Person

CERTIFICATE of QUALIFIED PERSON

I, Stephen Farmer, do hereby certify that:

1. I am currently employed as a Control Systems Engineer by:

   Fluor Canada Ltd, at 700-1075 West Georgia Str, Vancouver, BC, Canada V6E 4M7

2. I am a graduate of University of British Columbia (Bachelor of Applied Science, Mechanical Engineering, 1989).

3. I am a registered Professional Engineer in the Province of British Columbia, Canada.

4. My overall experience includes 18 years of EPC project work directly related to Control Systems engineering. My more relevant "mining specific" experience includes the last 7 years working in the Fluor Vancouver office on numerous mining studies and detailed design mining projects.

5. I have read the definition of "qualified person" set out in National instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am responsible for Section 18.9 of the technical report titled "Ajax Project, NI 43-101 Technical Report, Feasibility Study Update" (the "Technical Report"), dated February 19, 2016, prepared for KGHM Ajax Mining Inc. (KAM).

7. I acted as a lead Control Systems engineer for my specific area of responsibility during the two past phases of the project, the Feasibility Study Update phase from September 2014 to December 2014 and the Basic Engineering phase, from March 2015 to October 2015

8. I visited the property on February 10th, 2016.

9. As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information required to be disclosed to make the report not misleading.

10. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 19th day of February, 2016.

Signature of Qualified Person [Seal]

Stephen Farmer
Print name of Qualified Person