Memo

Date: 12 December 2016

To: KGHM Ajax Mining Inc.

From: Amec Foster Wheeler Environment & Infrastructure

Ref: KGHM Ajax Project
Environmental Assessment Application/Environmental Impact Statement

Re: Round 2 Federal Information Requests – Response to CEAA-001.1

1.0 INTRODUCTION

The KGHM Ajax Project Environmental Assessment Application/Environmental Impact Statement (Application/EIS) for a Comprehensive Study was formally submitted for review to the British Columbia (BC) Environmental Assessment Office and the Canadian Environmental Assessment Agency (CEAA) on January 18, 2016. CEAA provided KGHM Ajax Mining Inc. (KAM) with Information Request (IRs). Amec Foster Wheeler Environment & Infrastructure has prepared this memorandum in response to IR number CEAA-001.1.

2.0 INFORMATION REQUEST

There are two IRs submitted by CEAA on the topic of proposed mitigation measures associated with Current Use of Land for Traditional Purposes (CULRTP).

CEAA-001

"Proposed mitigation measures address the biophysical attributes which support the CULRTP. No description is provided as to how the mitigation measures address activity-based attributes of CULRTP. In particular, no information is provided on the ability of the Fish Habitat Offsetting Plan to mitigate effects to fishing use or associated activities or the effectiveness of that mitigation.

IR: Where biophysical mitigation measures are proposed to mitigate activities associated with CULRTP, please provide a rationale as to why the mitigation measures are applicable. Provide a list of any additional mitigation measures, beyond the biophysical mitigation measures, that have been developed to specifically address the activity-based attributes of CULRTP. Provide a discussion of the anticipated effectiveness of all relevant mitigation measures to reduce effects to CULRTP for all Aboriginal groups."

Suite 600 - 4445 Lougheed Highway
Burnaby, BC V5C 0E4
Tel +1 604 294 3811
Fax +1 604 294 4664

Amec Foster Wheeler Environment & Infrastructure
Registered office: 2020 Winston Park Drive, Suite 700, Oakville, Ontario L6H 6X7
Registered in Canada No. 773289-9; GST: 899879050 RT0008; DUNS: 25-362-6642
amecfw.com

The supplementary memo 0707_KAM_Response to CEAA IR 001 was submitted in response to IR CEAA 001.

CEAA-001.1

"In addition to the low/moderate/high ranking for the effectiveness of mitigation measures, provide a description and where possible quantification of the effectiveness for each mitigation measure on reducing impacts to activities associated with CULRTP rather than a discussion of the effectiveness of the overall Environmental Management Plan.

Confirm that mitigation measures are based on the current design and layout of the Project."

3.0 RESPONSE

The following information has been prepared to address the CEAA-001.1, listed above.

CEAA-001.1 Response

A summary of measures proposed to mitigate Project effects on fishing activities, hunting and trapping activities, plant gathering activities and other cultural/ceremonial activities are listed in **Table 1**. The mitigation measures, rationale for inclusion, and effectiveness rating apply to all Aboriginal Groups. In cases where the mitigation measure listed is an Environmental Plan, details have been provided expanding on how the scope and mitigations included in the Plan address CULRTP. In addition to ranking effectiveness of mitigation as high, moderate or low, a description of the effectiveness of mitigation has been added, including quantification of the effectiveness when possible. It is important to note, however, that effectiveness of a mitigation depends on conditions such as proper execution and site conditions. In many cases, quantification of effectiveness of mitigation will be done through monitoring; therefore, monitoring parameters and target criteria have been included. It is anticipated that Aboriginal Groups will be engaged in these monitoring activities. The explanation of high, moderate or low effectiveness ranking criteria is listed in **Table 2**.

It is important to note that all the mitigation measures included in **Table 1** are part of the current Project design.

Table 1: Mitigation Measures, Mitigation Rating and Description

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
Fishing Opportunities and Practices			
Change in the availability of fish species harvested	Mitigation and Best Management Practices:		
	Meet the recommended flow threshold for BC streams and, as needed, work with the provincial government to manage releases from the Peterson Creek Downstream Pond to meet instream flow needs. Recycle water to the greatest extent possible.	Maintaining flow thresholds will reduce sub-lethal effects to fish populations and, therefore, maintain the availability of fish species for harvesting.	Moderate The Peterson Creek Diversion System will be designed to preserve flows to existing fish habitat and Aboriginal fishing area downstream of Jacko Lake Dam (JLD1) for a minimum of 100 metres (m) in Peterson Creek. The design further aims to maintain current (pre-mining) flow conditions and allow fish passage as much as practicable. The system will be designed with a low level decant pipe discharge system with a flow capacity in the range of 38 – 71 l/s, as required by the water bailiff according to the requirements for downstream water users (BGC Engineering Inc., 2015). The low-level decant is required during dry periods resulting in lake levels below the spillway/outlet crest elevation. There will be no release from Jacko Lake when the water level falls below the inlet of the decant pipe. Additional hydraulic data and habitat modelling analyses are being undertaken to assess potential impact to fish habitat during October to March (Norwest Corporation, 2016). A memorandum outlining potential mitigation strategies to minimize predicted reduction in streamflows on Lower Peterson Creek was also provided in response to information requests from the BC Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (DFO). This memo is intended to provide a framework for discussion with regulators and stakeholders. Further, the development of a streamflow mitigation plan that is acceptable to regulators and stakeholders is expected to be an iterative process (BGC Engineering Inc., 2016).
	The potential effects of increased fishing pressure associated with the introduction of workers (who may fish in Jacko Lake) will be mitigated through no-fishing policies for workers and contractors at site during their shifts.	A no-fishing policy for workers and contractors will reduce the potential for increased fishing pressure and maintaining availability of fish populations for harvesting.	High No-fishing policies are an effective measure to limit fishing pressure caused by workers and contractors. The policies will be enforced and those who do not comply will be removed from the Project. This measure will mitigate the potential increase in fishing pressure from introduction of the workforce, representing potentially 17 anglers during the Construction Phase and 10 anglers during the Operation Phase.
	Fish salvage will be conducted in any work areas that will be dewatered.	Fish salvages will return any fish potentially affected by dewatering to their original habitat, keeping them available for harvest.	High Fish salvaging is an effective method to keep fish available by relocating fish from a location that will be disturbed. A significant proportion of fish can be salvaged and survival during the salvage can be as high as 95–100% (Ackerman, 2005).
	Project components that will be constructed within the wetted areas of creeks or lakes (e.g., the northeast dyke, Peterson Creek Bridge and Kamloops Lake Water Intake) will be conducted in the dry, either by scheduling the work for low-flow periods or by isolating (e.g., using cofferdams) and dewatering the work area.	This measure maintains the population of fish in potentially affected waterbodies or schedules construction activities in least-risk windows to minimize effects to the fish populations, ensuring their availability for harvest.	High Conducting construction in the dry is an effective measure to prevent direct fish mortality or injury due to equipment crushing or burying fish and limit indirect impacts to fish caused by changes in water quality due to sediment inputs or leaks of fuel, oil or grease.
	Blast Design (Section 6.7 of the Application/EIS). Description: Blast designs include measures to protect fish and fish habitat, including minimizing the amount of explosives detonated simultaneously, using delays between detonations, and reducing of blast-hole diameters. No blasts will be detonated at the streambed/water interface. Noise and vibration will be monitored to ensure thresholds for the protection of fish are not exceeded.	A review of literature on fish mortality was carried out and it was determined that the measures proposed would not result in residual effects to the fish populations in Jacko Lake; the populations would therefore still be available for harvest.	High Blasts will be designed to limit direct mortality of fish, sub-lethal effects or changes in behaviour due to noise and vibration. The blast design will follow guidelines for the protection of fish (DFO, 2013) and Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky 1998) which are: • Ground vibration level of 13 mm/s PPV • Air blast overpressure level of 194 dBL
	No equipment refuelling or servicing will be undertaken within 30 m of any watercourse or surface water drainage.	This measure will reduce the risk of fuel spills to riparian habitats and into fish-bearing water bodies, maintaining healthy habitats and populations for the fish populations available for harvest.	High A distance of 30 m is considered sufficient to prevent any potential spill of oil, grease or fuel from reaching the watercourse during equipment servicing.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	All hydraulic machinery entering a stream or waterbody will use hydraulic fluids that are non-toxic to aquatic life and that are readily or inherently biodegradable.	Use of biodegradable hydraulic fluids will reduce mortality to fish populations exposed to this machinery and ensure their availability for harvest.	High This measure is effective at limiting mortality of fish caused by direct toxicity or long-term contamination of water by machinery entering a stream.
	Surface Water Quality Management and Monitoring Plan (SWQMMP) (Section 11.23) Description: The focus of the SWQMMP is on minimizing Project effects on surface water quality, regulatory compliance, monitoring the effectiveness of mitigation measures, and verifying the predictions completed as part of the effects assessment of the Project. The primary source of mitigation measures for surface water quality is the Water Management and Hydrometric Monitoring Plan (Section 11.7). The SWQMMP is designed to limit generation of contact water (i.e., water that comes into contact with and may pick up a geochemical load from a Project facility) and to prevent sediment laden runoff from leaving the site.	Implementation of Best Achievable Control Technology or management practices will maintain surface water quality and resources available for harvest.	Moderate By implementing a combination of measures, effects on surface water quality will be mitigated. To ensure effectiveness of the mitigation measures, the SWQMMP details procedures for monitoring surface water quality and ensure, among others, that parameters listed in the *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CCME, 1999) are met. This guideline presents thresholds values for water parameters such temperature, dissolved oxygen, turbidity, pH, nutrients, metals and organics within a range suitable for maintaining healthy populations of fish and other aquatic organisms. Monitoring will be implemented with a focus on assessing for changes in surface water quality compared to baseline and predicted concentrations, water quality guidelines and site-specific water-quality benchmarks.
	Groundwater Quality Management and Monitoring Plan (GWQMMP) (Section 11.24) Description: The focus of the GWQMMP is on regulatory compliance, monitoring the effectiveness of mitigation measures, and verifying the predictions completed as part of the effects assessment of the Project. The primary source of mitigation measures for groundwater quality is the Water Management and Hydrometric Monitoring Plan (Section 11.7). The GWQMMP is designed to protect groundwater quality from seepage and runoff down-gradient of Project facilities in the Peterson Creek watershed.	Implementation of Best Achievable Control Technology or management practices will maintain groundwater quality and resources available for harvest.	High By implementing a combination of measures, effects on groundwater quality will be mitigated, contributing to maintaining fish availability. To ensure effectiveness of the mitigation measures, the Groundwater Flow Model incorporated sensitivity analyses that help to evaluate their effectiveness, as well as other sources of uncertainty in the models. For example, the groundwater flow scenarios show that the majority of seepage pathways from the Tailings Storage Facility (TSF) and Mine Rock Storage Facilities (MRSFs) are to the Open Pit; however, all scenarios have some seepage pathways that eventually reach the receiving environment in Peterson Creek (ERM, 2016a). The GWQMMP relies on monitoring to verify the mitigation and management measures are adequate, perform as predicted in the effects assessment, and provide information for adaptive management if unanticipated effects on groundwater are discovered. Groundwater quality results will be compared against baseline ranges for each monitoring well, as well as generic water quality guidelines. For most parameters, action triggers will be developed for monitoring results that exceed generic water quality guidelines specific to the downstream users.
	Erosion and Sediment Control Plan (ESCP) (Section 11.2) Description: The ESCP has been established to manage mitigation approaches designed to prevent or minimize erosion and contain sediment within the mine site. The environmental protection measures associated with mitigation of erosion and sedimentation focus on: • Incorporation of erosion and sedimentation control into design and planning (e.g. minimize disturbance, progressive reclamation); • Application of erosion control Best Management Practices (BMPs) (e.g., re-contouring stockpiles of soil and overburden to a 2H:1V slope and seeding for erosion control); • Application of sediment and runoff control BMPs (e.g., minimizing the area of exposed soils, timely seeding and planting, and the use of erosion control measures appropriate to the soil erodibility potential in the TSF); and • Monitoring and maintenance (e.g., sediment control and runoff management structure functionality will be maintained by removing sediment captured in traps before it exceeds 15% loss of trap capacity).	Implementation of Best Achievable Control Technology or management practices will maintain surface water quality and resources available for harvest.	High By implementing a combination of measures, such as erosion control, effects on water quality will be mitigated, contributing to maintaining fish availability. To ensure effectiveness of the mitigation measures, the ESCP relies on continuous monitoring to verify that the management practices are adapted to local conditions, are properly executed, and, if needed, more detailed site-specific prescriptions are completed. For example, areas affected by erosion will be mapped and information—including erosion type, intensity, the extent of the affected area, site UTM coordinates, and existing control measures and an assessment of their performance—will be documented. Affected sites will be regularly checked for evidence of erosion, particularly after rainfall events, until erosion is not a concern. Monitoring results will be used to trigger an appropriate adaptive management response. The effectiveness of the ESCP will be assessed regularly (at least annually). The reviews will reflect changes in environmental requirements, technology and operational procedures.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Metal Leaching and Acid Rock Drainage (ML/ARD) Management and Monitoring Plan (Section 11.5) Description: The purpose of the ML/ARD Management and Monitoring Plan is to formulate a series of operational procedures and closure activities that will avoid the development of acidic drainage from the Project Mine Rock Storage Facilities (MRSFs), TSF and ore stockpiles and minimize the impact of neutral metal leaching to the receiving environment from these facilities. Management strategies specific to the Project include the following: • Locate mine rock storage facilities to areas east and south of the Open Pit to increase distance from the City of Kamloops and facilitate collection of seepage; • Segregate high-risk versus low-risk rock types in the pit; • Blend potentially acid generating (PAG) and non-potentially acid generating (NPAG) materials in proportions appropriate to prevent ARD onset; • Construct a NPAG base for the blended MRSFs; • Limit infiltration by the implementation of a cover; • Minimize east MRSF size and construct only of NPAG material to limit seepage over the Peterson Creek Aquifer; • Peterson Creek Diversion constructed to limit the quantity of contact water discharging to Peterson Creek; • In-pit backfill contains seepage and prevents discharge to receiving water streams; and • Use liner systems in the TSF where tailings are in contact with embankments to limit infiltration of tailings pore water.	Implementation of Best Achievable Control Technology or management practices will maintain surface water quality and resources available for harvest.	<u>High</u> By implementing a combination of measures to prevent development of acidic drainage, negative effects on water quality (e.g., changes in pH and concentration of metals), and therefore on fish can be mitigated. Effective mitigation is achieved by addressing geochemical, hydrological and geotechnical factors of risks (BC MEM, 1998) through a diversity of measures. For example, blending PAG and NPAG mine rock might be an effective measure to prevent generation of acid drainage when comprehensive material characterization, waste design and construction plans are supported by detailed prediction information (BC MEM, 1998). Similarly, the use of a cover on waste rock piles is an effective measure to reduce water infiltration. The MRSF closure cover reduces infiltration through the mine rock and into the groundwater system. As outlined in Appendix A of Appendix 6.4-C of the Application/EIS, a cover design that incorporates a 0.6 m till layer (0.3 m of which is compacted) between the mine rock and the topsoil is anticipated to reduce annual infiltration from 44 millimetres (mm) to 8 mm. To ensure effectiveness of the mitigations, monitoring will include: in-pit monitoring and sampling (e.g., ore identification and management, segregation of PAG and NPAG mine rock), seepage and tailings slurry water quality monitoring, and commissioned of on-site laboratory.
	Air Quality Monitoring and Dust Control Plan (Section 11.6) Description: This Plan includes measures to reduce emissions and dust that could deposit on water surfaces. A supplemental submission was developed that provides more detail related to how dust mitigation measures will be implemented. This is documented in *Memorandum: Management of Fugitive Dust* (KAM, 2016a). As outlined in this Plan, KAM will implement both preventative procedures and reactive control measures in order to minimize dust emissions from the Project. Some key examples include: • Daily visual inspections of the TSF and active haul roads; • Application of water to the tailings beach and haul roads; • Application of dust suppressants on the TSF tailings beach and haul roads; • Application of surfactants to the haul roads; • Rotation of tailing spigot points; and • Use of polymers in the tailings thickening process and direct application to the tailings beach, when required.	Implementation of Best Achievable Control Technology or management practices for dust management will minimize dust deposition onto Jacko Lake and maintain surface water quality and resources available for harvest.	<u>High</u> By implementing a combination of measures, including dust control, effects on water quality will be mitigated, contributing to maintaining fish availability. To ensure effectiveness of the mitigation measures, the Air Quality Monitoring and Dust Control Plan relies on continuous monitoring. It can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system. Monitoring will identify changes in air quality in relation to guidelines and standards established by Canadian and BC applicable regulatory criteria.
	Water Management and Hydrometric Monitoring Plan (Section 11.7) Description: The water quality model of the Project was updated during the first round of IRs. The site water quality predictions in the TSF and water management ponds changed as a result of modifications to the water balance model, baseline inputs and geochemistry source terms for the mine source materials. The updated results of the assessment and	Contact vs non-contact water management is an intrinsic part of Project design. Water management practices will maintain surface water quality and resources available for harvest.	<u>High</u> By implementing a combination of measures, effects on water flow will be mitigated, contributing to maintaining fish availability. To ensure effectiveness of the mitigation measures for water flow, site monitoring and a follow-up program will be implemented to evaluate and document if the Water Management and Hydrometric Monitoring Plan is successfully avoiding and minimizing potential adverse effects to the environment.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	water quality mitigation measures are detailed in the document *KGHM Ajax Mining Inc. Ajax Project: Water Quality Prediction Updates and Information Request Responses* (Knight Piésold Consulting Ltd., 2016a). Some key examples of mitigation measures in the mine site Water Management and Hydrometric Monitoring Plan include: • South Mine Rock Storage Facility (SMRSF) Pond: manage seepage and runoff from the southern extent of the SMRSF; • Reclamation of SMRSF in Decommissioning and Closure with a low permeability till layer overlain with topsoil to reduce infiltration and maximize evapotranspiration and runoff; • Dry cover on TSF to reduce infiltration into the underlying tailings solids and increase non-contact runoff; • Peterson Creek Downstream Pond: interception of seepage from the SMRSF and West MRSF with associated water management ponds, reclaimed to mill for Operation Phase water demand. • Mitigation measures for flow reductions in Peterson Creek will be implemented to ensure that existing water license requirements are met. Eight potential mitigation options were identified and outlined in *Memorandum: Peterson Creek – Potential Streamflow Mitigation Strategies* (BGC Engineering Inc., 2016). Individually, or in combination, these options could be implemented to minimize or completely offset Project-related effects, and could also potentially benefit fish habitat in Lower Peterson Creek.		Specifically, monitoring will be used, in part, to verify the accuracy of flow predictions of the Environmental Assessment and determine the effectiveness of mitigation measures designed to reduce environmental effects, thus informing management if prescribed actions are meeting objectives. If adverse findings are evident from the monitoring of a particular area or process, adaptive management policies will be implemented. All monitoring components will be evaluated regularly to assess if changes to the schedule, frequency or component continue to be required or adaptively changed.
	Explosives Management Plan (Section 11.11) Description: This Plan includes measures to minimize effects on water and aquatic life related to transportation, on-site manufacturing, storage and use of explosives. For example, one measure is to limit the potential for the introduction of nitrogenous nutrients from explosives to water. In relation to the location of the explosive facilities, *Memorandum: Location of the explosives facility* (KAM, 2016b) states that the alternate location for the explosives manufacturing and storage as presented in the Application/EIS would now be the confirmed location for this facility. The selected location is situated 4.5 kilometres (km) northwest of the pit.	Explosives handling practices will minimize potential for interactions with surface water quality and maintain habitats and resources available for harvest.	<u>High</u> The Explosives Management Plan will include detailed plans of the explosives facility, specifications for the maintenance of an inventory system, etc., to ensure proper management of explosives. To verify effectiveness of measures included in the Plan, monitoring includes regular inspections of storage facilities for leaks or non-compliance with policies and procedures.
	Soil Salvage and Handling Plan (Section 11.3) This Plan includes measures and procedures for adequate soil handling as well as erosion control on stockpiles, limiting transport of soil to the aquatic environment. The Soil Salvage and Handling Plan provides the procedures for soil stripping and quality control of soil salvaging.	Soil handling practices, in combination with Erosion and Sediment Control, will minimize potential for interactions with surface water quality and resources available for harvest.	<u>High</u> By implementing best managements practices while salvaging soil (e.g., avoiding soil salvaging during adverse weather, protecting soil stockpiles against erosion), the potential for erosion and transport of soil to the aquatic environment can be effectively mitigated thus indirectly protecting fish habitat and availability of fish. To achieve effective mitigation, soil stripping management and erosion will be monitored, as will soil contamination (e.g., potential contaminant accumulation and metal deposition / mobility patterns). Soil quality should be maintained within Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME, 2013) and Soil Criteria for Toxicity to Soil Invertebrates and Plants listed in the *Contaminated Sites Regulation*, included in BC's *Environmental Management Act*.
	Dark Sky Management and Monitoring Plan (Section 11.19) This Plan included measures to eliminate spill light and glare and limit sky glow, which can affect behaviour of wildlife, including fish surrounding the Project. Protection measures will include illumination management (e.g., setting timers, placing motion sensors), shielding and direct lighting (e.g., directing light and/or shielding light to target	Implementation of Best Achievable Control Technology or management practices will maintain habitats and resources available for harvest.	<u>High</u> The Dark Sky Management and Monitoring Plan includes measures for spectral control that are effective for limiting the effect of spill light, which may have an effect on fish. Native flora and fauna are often sensitive and responsive to light in the short wavelength range (less than 500 nm), where ultraviolet light plays an important role for navigation, foraging and mate selection (Bruce-White & Shardlow, 2011). The use of 500 nm filtered LED fixtures will make it possible to control the colour of the light and limit the effect of spill light

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	areas), and spectral control (e.g., use of 500 nanometre [nm] filtered LED fixtures).		at the local scale and the effect of sky glow at the regional scale. Sky darkness will be monitored at least twice a year and compared to baseline conditions to determine changes resulting from Project illumination. If changes in sky darkness are observed, then adaptive management lighting options will be assessed based on magnitude and duration of the activities as well as in response to concerns raised by local residents.
	Noise and Vibration Management Plan (Section 11.22) This Plan includes measures to achieve vibration objectives and limit blast-related vibration effects for the Jacko Lake fish habitat area.	Implementation of Best Achievable Control Technology or management practices will maintain habitats and resources available for harvest.	<u>High</u> To ensure effectiveness of mitigation measures, the Plan includes monitoring of vibration limits according to various guidelines. In particular for the protection of fish in the Jacko Lake area, the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters will be followed (Wright & Hopky, 1998). This guideline specifies that no explosive is to be detonated in or near fish habitat that produces, or is likely to produce, an instantaneous pressure change (i.e., overpressure) greater than 100 kPa (14.5 psi) to prevent the overpressure from damaging fish swimbladder, kidney, liver, spleen, fish eggs and larvae.
	Fisheries and Aquatic Life Monitoring Plan (Section 11.25) The Fisheries and Aquatic Life Monitoring Plan focuses on ensuring regulatory compliance, implementation of mitigation measures, monitoring the effectiveness of mitigation measures, and verifying the predictions completed as part of the assessment of potential effects, including: • Loss of habitat in Peterson Creek related to the Open Pit and the MRSFs; • Loss of habitat and altered fish distribution and abundance in Peterson Creek downstream of the Project resulting from reduced flow; • Impact of mining dust and vibrations on fish in Jacko Lake; and • Loss of habitat in northeastern arm of Jacko Lake related to Open Pit development; etc.	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats to ensure resources are available for harvest.	<u>Moderate</u> To ensure effectiveness of mitigation measures to protect fish and fish habitat, the Fisheries and Aquatic Life Monitoring Plan includes monitoring procedures. For example, under the *Fisheries Act* Authorization, it is required to monitor that environmental protection measures are in place and in working order, measure the affected habitat area, monitor water quality, make visual observations regarding fish and fish habitat and evaluate the post-construction effectiveness of the habitat offsetting works (on vegetation, hydrological conditions, and fish and fish habitat).
	<u>Compensation:</u>		
	Fish Habitat Offsetting Measures (Knight Piésold Consulting Ltd., 2016b) The updated Fish Habitat and Fishery Offsetting Plan includes components to support revitalization and continuation of the asserted SSN spring fishery at both the inlet and outlet of Jacko Lake. The measures proposed to enhance salmon habitat in Lower Peterson Creek also recognize broader stewardship interests of the SSN and other Aboriginal Groups regionally (ERM, 2016b).	Development of the Project would result in the permanent loss of fish habitat and associated productive capacity; therefore, offsetting options are required. Offsetting is required when residual, serious harm to fish remains after avoidance and implementation of mitigation measures.	<u>High</u> Based on the updated Fish Habitat and Fishery Offsetting Plan, net losses due to the Project are calculated to be 51,051 habitat units in total, which are proposed to be offset by 67,151 habitat units. The net increase in surface area and storage volume in Jacko Lake, combined with proposed enhancements to Upper Peterson Creek, will at minimum maintain and potentially increase productive capacity and rearing habitat for rainbow trout in Jacko Lake.
Change in access to, ability to access, or use of fishing areas	Install appropriate signage indicating blasting times.	Signage will inform fishers at Jacko Lake about appropriate times to access the area for fishing.	<u>High</u> Informing about blasting times will facilitate fishers' planning their access to the area at the most appropriate times to avoid blasting disturbances.
	Transportation Management Plan (Section 11.20) The following measures to manage traffic and minimize environmental impact are included in this Plan: industry-recognized design criteria and construction management practices for access improvement works; commuting trip demand reduction through car or vanpooling, bus staging, and staggering of shifts; heavy vehicle routing, including implementation of two-way radio communication and control processes to manage traffic movement as required; on- and off-site parking management for commuting staff; and spill containment and sediment control practices.	Access to fishing can be changed by increased mine-associated traffic; therefore, this mitigation measure was included.	<u>High</u> The access to the area for fishing will be less affected if traffic caused by the Project is reduced, which will result in increased road safety and decreased disruptions and delays compared to conditions if traffic is not controlled.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Supporting actions include: employment contract incentives for participation in initiatives to reduce travel demand; workplace travel planning; and community information, reporting, and feedback programs.		
	Compensation:		
	Ajax Mining Inc. Ajax Project: Conceptual Fish Habitat and Fishery Offsetting Plan This Plan includes improved access to Jacko Lake via a new road, boat launch, day-use area and shoreline trails for fishers. Access to the outlet of Jacko Lake at Peterson Creek will be retained throughout mine construction, operation and post-closure.	Access to fishing can be changed by increased mine-associated construction activities; therefore, these measures were added to the revised fisheries offsetting plan.	High By developing a new access road, boat launch and shoreline trails, the access to Jacko Lake for fishing will be maintained.
Change in the experience of using land and resources (sensory disturbances)	Noise mitigation through Project design includes the following measures: conveyor from crusher to plant will be covered to reduce noise emission; enclosed heavy equipment such as mills, secondary crusher, compressors, pumps, and motors will be located inside buildings; roads will be designed to minimize haul distances; large trucks will be used for ore and waste transport to minimize the number of trips required between the source and destination; and mobile equipment will be equipped with the manufacturer-recommended exhaust mufflers (Section 10.5).	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise and vibration on those practicing traditional uses of the lands.	High By implementing a combination of measures to reduce noise generated by the Project, noise levels will be maintained within target thresholds and will not prevent users of the area to undertake traditional activities. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of fish and human health are not exceeded.
	Blast Design (Section 10.5) Blast design minimizes disturbances to Jacko Lake and its users through measures including minimizing the amount of explosives detonated simultaneously, use of delays between detonations and reduction of blast-hole diameters. No blasts will be detonated at the streambed/water interface. Blasting will not occur during the seasonal spring trout fishery from sunrise to 10:00 AM if Aboriginal fishers are present.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise and vibration on those practicing traditional uses of the lands.	High Implementation of a blast design that considers avoiding blasting during seasonal spring trout fishery is an effective measure to mitigate blasting disturbance to fishers. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of fish and human health are not exceeded.
	Limit the use of vehicle horns during each shovel and haul truck loading cycle (Section 10.5).	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	Moderate Reducing to a minimum the frequency of vehicles horns emitted during daily hauling operations will contribute to maintaining the noise levels in the area to a level that will not prevent traditional activities from being undertaken. Noise levels will be maintained within guidelines for human health.
	Use multi-passenger vehicles to transport crews to and from job sites to reduce overall traffic noise emission (Section 10.5).	This will reduce the number of vehicles on the roads, reducing traffic noise and emissions.	High Reducing traffic noise will contribute to maintaining the noise levels in the area to a level that will not prevent traditional activities from being undertaken. Noise levels will be maintained within guidelines for human health.
	Conduct piling activities only during the daytime period (Section 10.5).	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High Limiting noise from piling activities will contribute to maintaining the noise levels in the area to a level that will not prevent traditional activities from being undertaken. Noise levels will be maintained within guidelines for human health.
	Noise mitigation and noise management plan (Section 10.5) This Plan includes measures to mitigate noise during each phase of the Project. General measures include the following: limit the use of vehicle horn during each shovel and haul truck loading cycle to the extent	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High By implementing a combination of measures to reduce noise generated by the Project, noise levels will be maintained to a level that will not prevent traditional activities from

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	allowed by safety regulations; operate vehicles within the posted maximum speed limits to reduce noise emission; use multi-passenger vehicles to transport crews to and from job sites to reduce overall traffic noise emission; conduct piling activities only during the daytime period; select best achievable technology (technology that can achieve lower noise emissions and that has been shown to be economically feasible through commercial application) for mine fleet equipment; maintain vehicles in good operating condition to meet emission standards (especially with exhaust silencers/mufflers); etc.		being undertaken. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded.
	Vibration management plan for blasting activities (Section 10.5) This Plan includes measures to mitigate vibration during each phase of the Project. Measures applicable to all phases include the following: manage and revise the controllable blast design parameters (i.e., confinement, charge length and diameter, charge decoupling, direction of initiation, and total shot duration) on an ongoing basis as needed during the Operation Phase; monitor ground vibrations and correlate with blast design predictions to determine if changes to blast design or procedures are necessary to reduce vibration; etc.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	<u>High</u> Implementation of a blast design that considers not blasting at preferred fishing times, particularly during seasonal spring trout fishery, is an effective measure to mitigate blasting disturbance to fishers. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded.
	Progressive re-vegetation of Project components and other disturbed areas will be completed on an ongoing basis during the Construction and Operation phases, with larger Project components further re-vegetated at Decommissioning and Closure (Section 8.3). Successful vegetation establishment will enhance the aesthetics of the area.	This measure will provide for the rapid re-vegetation of all temporarily disturbed areas and will minimize visual effects for Project components that may be visible to those practicing traditional uses of the lands.	<u>Moderate</u> Revegetation of disturbed areas in an effective way to enhance the aesthetics and natural aspect of the area although it requires time. The effectiveness of this measure increases as vegetation establishes in more areas overtime, through progressive revegetation. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good.
	Employ good visual design principles (Section 8.3) The visual design of the Project will consider local and regional landscape patterns and geometry (e.g., slope) in order to meet the needs of the resource values of the surrounding area, including economic, recreational and social values. Opportunities include: selecting plants for revegetation to match surrounding areas; sloping the Project components similarly to surrounding geomorphic characteristics; avoiding straight edges and instead contouring to form “ridges” or “valleys” when possible; among others.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	<u>High</u> Designing elements of the Project to mimic as much as possible the natural landforms, relief and vegetation of the area is an effective way to reduce the visual contrast caused by Project disturbances in the landscape.
	Infrastructure aesthetics will consider use of non-reflective materials in the construction of buildings and other infrastructure.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	<u>Low</u> This measure will contribute to reducing the visual contrast of the Project with the surrounding environment.
	Infrastructure will be painted with natural colours that blend into the landscape or will be screened with tall shrubs or trees.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	<u>Low</u> This measure will contribute to reducing the visual contrast of the Project with the surrounding environment.
	During the Post-Closure Phase, the re-vegetation of the Project components will be monitored to ensure that the vegetation is taking hold and growing in a manner sufficient to mimic the surrounding landscape.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	<u>Moderate</u> Revegetation of disturbed areas in an effective way to enhance the aesthetics and natural aspect of the area although it requires time. The effectiveness of this measure increases as vegetation establishes in more areas overtime, through progressive revegetation. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
			maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good.
Changes in the quality of resources	<u>To Mitigate Dust Fall on Water Bodies:</u>		
	Haul-road-associated dust will be mitigated with use of coarse gravel and aggregate material on road beds and by minimizing haul distances.	Implementation of Best Achievable Control Technology or management practices will minimize dust and contaminants entering water bodies and decreasing the quality of fish tissue.	<u>High</u> Implementing dust control measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	Other operational mitigation measures include watering haul roads, reducing idling of vehicles and equipment, and maintaining mobile equipment to meet emission standards.	Implementation of Best Achievable Control Technology or management practices will minimize dust and contaminants entering water bodies and decreasing the quality of fish tissue.	
	Design mitigation measures include the installation of covers over coarse and fine ore stockpiles.	Implementation of Best Achievable Control Technology or management practices will minimize dust and contaminants entering water bodies and decreasing the quality of fish tissue.	
	Implement dust collectors and the use of covered concentrate transport trucks.	Implementation of Best Achievable Control Technology or management practices will minimize dust and contaminants entering water bodies and decreasing the quality of fish tissue.	
	<u>To Mitigate Effects on Water Quality:</u>		
	Water Management and Hydrometric Monitoring Plan (Section 11.7) Description: The water quality model of the Project was updated during the first round of IRs. The site water quality predictions in the TSF and water management ponds changed as a result of modifications to the water balance model, baseline inputs and geochemistry source terms for the mine source materials. The updated results of the assessment and water quality mitigation measures are detailed in the document *KGHM Ajax Mining Inc. Ajax Project: Water Quality Prediction Updates and Information Request Responses* (Knight Piésold Consulting Ltd., 2016a). Some key examples of mitigation measures in the mine site Water Management and Hydrometric Monitoring Plan include: • SMRSF Pond: manage seepage and runoff from the southern extent of the SMRSF; • Reclamation of SMRSF in Decommissioning and Closure with a low permeability till layer overlain with topsoil to reduce infiltration and maximize evapotranspiration and runoff; • Dry cover on TSF to reduce infiltration into the underlying tailings solids and increase non-contact runoff; • Peterson Creek Downstream Pond: interception of seepage from the SMRSF and West MRSF with associated water management ponds, reclaimed to mill for Operation Phase water demand.	Contact vs non-contact water management is an intrinsic part of Project design. Water management practices will minimize contaminants entering water bodies and decreasing the quality of fish tissue.	<u>High</u> By implementing a combination of measures, effects on water quality will be mitigated, contributing to maintaining fish quality. To ensure effectiveness of the mitigation measures, site monitoring and follow-up programs will be implemented to evaluate and document if the Water Management and Hydrometric Monitoring Plan is successfully avoiding and minimizing potential adverse effects to the environment. Specifically, monitoring will be used in part to verify the accuracy of flow predictions of the Environmental Assessment and determine the effectiveness of mitigation measures designed to reduce environmental effects, thus informing management if prescribed actions are meeting objectives. If adverse findings are evident from the monitoring of a particular area or process, adaptive management policies will be implemented. All monitoring components will be evaluated regularly to assess if changes to the schedule, frequency or component continue to be required or adaptively changed.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	• Mitigation measures for flow reductions in Peterson Creek will be implemented to ensure that existing water license requirements are met. Eight potential mitigation options were identified and outlined in *Memorandum: Peterson Creek – Potential Streamflow Mitigation Strategies* (BGC Engineering Inc., 2016). Individually, or in combination, these options could be implemented to minimize or completely offset Project-related effects, and could also potentially benefit fish habitat in Lower Peterson Creek.		
	Construction Waste Management Plan (Section 11.4) This Plan includes measures to handle, storage and dispose of solid waste during construction of the Project.	Siting of waste management facilities and implementation of appropriate waste management practices will minimize contaminants entering water bodies and decreasing the quality of fish tissue.	High Managing solid waste is an indirect measure to protect the quality of resources by preventing non-hazardous waste and putrescible food from reaching the waterbodies and contaminating fish and fish habitat during construction of the Project.
	Solid Waste Management Plan (Section 11.9) This Plan includes measures to handle, storage and dispose of solid waste during operation of the Project.	Siting of waste management facilities and implementation of appropriate waste management practices will minimize contaminants entering water bodies and decreasing the quality of fish tissue.	High Managing solid waste is an indirect measure to protect the quality of resources by preventing non-hazardous waste and putrescible food from reaching the waterbodies and contaminating fish and fish habitat during operation of the Project.
	Soil Salvage and Handling Plan (Section 11.3) This Plan includes measures and procedures for adequate soil handling as well as erosion control on stockpiles, limiting transport of soil to the aquatic environment. The Soil Salvage and Handling Plan provides the procedures for soil stripping and quality control of soil salvaging.	Soil handling practices, in combination with Erosion and Sediment Control, will minimize potential for contaminants entering water bodies and decreasing the quality of fish tissue.	High By implementing best managements practices while salvaging soil (e.g. avoiding soil salvaging during adverse weather, protecting soil stockpiles against erosion), the potential for erosion and transport of soil to the aquatic environment can be effectively mitigated thus indirectly protecting fish habitat and availability of fish. To achieve effective mitigation, soil stripping management and erosion will be monitored, as will soil contamination (e.g., potential contaminant accumulation and metal deposition / mobility patterns). Soil quality should be maintained within Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME, 2013) and Soil Criteria for Toxicity to Soil Invertebrates and Plants listed in the *Contaminated Sites Regulation*, included in BC's *Environmental Management Act*.
	Hazardous Waste Management Plan (HWMP) (Section 11.10) This Plan includes measures for classifying, handling, storing, transporting and disposing of hazardous waste materials that could impact fish habitat during construction, operation and closure.	Siting of waste management facilities and implementation of appropriate waste management practices will minimize contaminants entering water bodies and decreasing the quality of fish tissue.	High By implementing a combination of measures, including hazardous waste management, effects on water quality will be mitigated, contributing to maintaining fish quality. To ensure effectiveness of the mitigation measures, the HWMP relies on monitoring to ensure storage, movements and treatment of hazardous waste meet performance objectives and regulatory guidelines. Monitoring will include documentation of each shipment to ensure traceability; inspections of hazardous waste storage areas, landfarm, and oil water separator; and others.
	Risk Management Plan (RMP) (Accidents and Malfunctions) (Section 11.12) This Plan includes measures for early detection of major risks, risk reduction, loss control and strategies to minimize the effects on the environment, including fish habitat. The risks of major concern that warrant specific environmental protection measures are failure of the pit wall adjacent to Jacko Lake and failure of the TSF through dam break and inundation. The mitigation measures included in the Plan are of proactive/preventative nature and include design measures to prevent pit wall failure and TSF dam breach. For example, the TSF includes several design features that significantly improve embankment stability and protect against downstream slope failures that could lead to a breach. These are a mine rock buttress and/or MRSF included on the downstream side of the northern and eastern embankments to increase the Factor of Safety against a breach several times higher than the minimum design requirement; additional freeboard allowance for	Implementation of risk management practices will minimize potential for contaminants entering water bodies and decreasing the quality of fish tissue.	High To ensure effectiveness of the mitigation measures, the RMP relies on monitoring the risk protection measures incorporated in the engineering design of the Project, fundamentally of the pit wall adjacent to Jacko Lake and of the structural integrity of the TSF. A Quantitative Risk Assessment of dam breach risk is envisaged and additional mitigation measures will be evaluated for inclusion in the next stage of design.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Probable Maximum Flood conditions and wave-run up for all stages of dam development; an absence of continuous weak layers that could adversely impact dam foundation stability; and the supernatant pond located several hundred metres from the dam (post start-up).		
	Emergency Response Plan (ERP) (Section 11.14) This Plan includes measures and procedures to address emergencies, that is, situations that immediately threaten the well-being of people and the environment, emphasizing containment, notification and mobilization to deal with the emergency (e.g., wildlife encounters and incursions, seismicity, and water or tailings management failure).	Implementation of emergency response planning will ensure timely incident response and minimize contaminants entering water bodies and decreasing the quality of fish tissue.	High By implementing the measures and procedures outlined in the ERP, it would be possible to quickly address and contain risks associated with specific emergencies, thus limiting negative effects on the environment and protecting the quality of traditional resources harvested (e.g., fish).
	Landscape Design and Restoration Plan (Section 11.26) This Plan includes conceptual strategies to achieve landscape capability and productivity objectives, with the final goal of establishing self-sustaining vegetation communities that will foster the development of functional Post-Closure Phase ecosystem units consistent with the Valued Components (VCs) identified for the Project. The specified end land uses are agriculture, wildlife and recreation. The Plan outlines the goals of constructing geologically stable landforms with low rates of soil erosion, maintaining acceptable water quality standards, mitigating aesthetic and environmental impacts, restoring ecological functions, and meeting end land-use objectives during operation and closure of the Project.	Planning for restoration and closure will minimize potential for contaminants entering water bodies and decreasing the quality of fish tissue.	Moderate Incorporating the end land uses into the Project design is an effective way to direct the implementation of mitigation measures towards achieving the end land uses. For example, stockpiling or relocating salvaged soils to areas that will soon be revegetated, thus reducing the potential for soil erosion; increasing or enhancing fish habitat to maintain traditional fishing practices; selecting and planting species that will enhance wildlife habitat for hunting or for plant gathering around Jacko Lake, etc.
	GWQMMP (Section 11.24) Description: The focus of the GWQMMP is on regulatory compliance, monitoring the effectiveness of mitigation measures and verifying the predictions completed as part of the effects assessment of the Project. The primary source of mitigation measures for groundwater quality is the Water Management and Hydrometric Monitoring Plan (Section 11.7). The GWQMMP is designed to protect groundwater quality from seepage and runoff down-gradient of Project facilities in the Peterson Creek watershed.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering water bodies and decreasing the quality of fish tissue.	High By implementing a combination of measures, effects on groundwater quality will be mitigated, contributing to maintaining fish availability. To ensure effectiveness of the mitigation measures, the Groundwater Flow Model incorporated sensitivity analyses that help to evaluate their effectiveness, as well as other sources of uncertainty in the models. For example, the groundwater flow scenarios show that the majority of seepage pathways from the TSF and MRSFs are to the Open Pit; however, all scenarios have some seepage pathways that eventually reach the receiving environment in Peterson Creek (ERM 2016a). The GWQMMP relies on monitoring to verify the mitigation and management measures are adequate, perform as predicted in the effects assessment, and provide information for adaptive management if unanticipated effects on groundwater are discovered. Groundwater quality results will be compared against baseline ranges for each monitoring well, as well as generic water quality guidelines. For most parameters, action triggers will be developed for monitoring results that exceed generic water quality guidelines specific to the downstream users.
	ESCP (Section 11.2) Description: The ESCP has been established to manage mitigation approaches designed to prevent or minimize erosion and contain sediment within the mine site. The environmental protection measures associated with mitigation of erosion and sedimentation focus on: • Incorporation of erosion and sedimentation control into design and planning (e.g., minimize disturbance, progressive reclamation); • Application of erosion control BMPs (e.g., re-contouring stockpiles of soil and overburden to a 2H:1V slope and seeding for erosion control); • Application of sediment and runoff control BMPs (e.g., minimizing the area of exposed soils, timely seeding and	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering water bodies and decreasing the quality of fish tissue.	High By implementing a combination of measures, including soil erosion control, effects on water quality will be mitigated, contributing to maintaining fish quality. To ensure effectiveness of the mitigation measures, the ESCP relies on continuous monitoring to verify that the management practices are adapted to local conditions, are properly executed, and, if needed, more detailed site-specific prescriptions are completed. For example, areas affected by erosion will be mapped and information including erosion type, intensity, the extent of the affected area, site UTM coordinates, and existing control measures and an assessment of their performance will be documented. Affected sites will be regularly checked for evidence of erosion, particularly after rainfall events, until erosion is not a concern. Monitoring results will be used to trigger an appropriate adaptive management response. The effectiveness of the ESCP will be assessed regularly (at least annually). The reviews will reflect changes in environmental requirements, technology and operational procedures.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	planting, and the use of erosion control measures appropriate to the soil erodibility potential in TSF); and • Monitoring and maintenance (e.g., sediment control and runoff management structure functionality will be maintained by removing sediment captured in traps before it exceeds 15% loss of trap capacity).		
	ML/ARD Management and Monitoring Plan (Section 11.5) Description: The purpose of the ML/ARD Management Plan is to formulate a series of operational procedures and closure activities that will avoid the development of acidic drainage from the Project MRSFs, TSF and ore stockpiles and minimize the impact of neutral metal leaching to the receiving environment from these facilities. Management strategies specific to the Project include: • Locate MRSFs to areas east and south of the Open Pit to increase distance from the City of Kamloops and facilitate collection of seepage; • Segregate high-risk versus low-risk rock types in the pit; • Blend PAG and NPAG materials in proportions appropriate to prevent ARD onset; • Construct an NPAG base for the blended MRSFs; • Limit infiltration by the implementation of a cover; • Minimize East MRSF size and construct it only of NPAG material to limit seepage over the Peterson Creek Aquifer; • Peterson Creek Diversion constructed to limit the quantity of contact water discharging to Peterson Creek; • In-pit backfill contains seepage and prevents discharge to receiving water streams; and • Use liner systems in the TSF where tailings are in contact with embankments to limit infiltration of tailings pore water.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering water bodies and decreasing the quality of fish tissue.	<u>High</u> By implementing a combination of measures to prevent development of acidic drainage, negative effects on water quality (e.g., changes in pH and concentration of metals), and therefore on fish can be mitigated. Effective mitigation is achieved by addressing geochemical, hydrological and geotechnical factors of risks (BC MEM, 1998) through a diversity of measures. For example, blending PAG and NPAG mine rock might be an effective measure to prevent generation of acid drainage when comprehensive material characterization, waste design and construction plans are supported by detailed prediction information (BC MEM, 1998). Similarly, the use of a cover on waste rock piles is an effective measure to reduce water infiltration although quantification of effectiveness (e.g., 80% of infiltration prevented by a soil cover) depends on final design criteria. To ensure effectiveness of the mitigations, monitoring will include: in-pit monitoring and sampling (e.g., ore identification and management, segregation of PAG and NPAG mine rock), seepage and tailings slurry water quality monitoring, and commissioned of on-site laboratory.
Hunting and Trapping Opportunities and Practices			
Change in the availability of species harvested	<u>Avoidance:</u>		
	Specific mine footprints were redesigned to ensure the minimum possible effect on habitat. As a result of concerns about potential effects to the Cherry Creek watershed, KAM relocated the TSF away from the Alkali Creek watershed (including Cherry Creek). The location and redesign to a conventional TSF reduces potential for dust by using wet tailings storage methods. As a result of concerns raised with respect to Inks Lake (an area widely used by waterfowl, other wildlife, and Aboriginal Groups) the updated General Arrangement no longer directly overlaps Inks Lake.	Redesign of the Project footprints will minimize effects to habitat.	<u>High</u> By re-designing the mine footprints, the disturbance to wildlife that widely use Cherry Creek and Inks Lake was avoided, thereby preserving their availability in these areas for hunting.
	With respect to deer, sensitive sites (e.g., deer wintering habitat planning cells) will be avoided as possible and where practical.	Avoidance of sensitive deer sites will ensure that habitat and, therefore, deer populations are available for harvesting.	<u>Moderate</u> By avoiding impacts to deer-sensitive sites, loss of habitat will be mitigated and the area may continue to be used by deer. Although other factors may affect area utilization by this species (e.g., noise or presence of people), keeping suitable habitat may contribute to maintaining deer presence in the area and, therefore, deer availability for hunting.
	Sharp-tailed grouse leks will be avoided if possible and where practical.	Avoidance of leks will ensure that habitat and, therefore, sharp-tailed grouse populations are available for harvesting.	<u>Moderate</u>

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
			By avoiding removal of sharp-tailed grouse leks, loss of habitat will be mitigated and the area may continue to be used by sharp-tailed grouse. Although other factors may affect area utilization by this species (e.g., noise or presence of people), keeping suitable habitat may contribute to maintaining grouse presence in the area and, therefore, grouse availability for hunting.
	Deer wintering habitat planning cell locations will be provided to reduce or avoid impacts to these sites.	Knowledge of deer wintering habitat planning cell locations will allow KAM to avoid these sensitive sites and will ensure that habitat and, therefore, deer populations are available for harvesting.	Moderate By avoiding impacts to deer wintering habitat, loss of habitat will be mitigated and the area may continue to be used by deer. Although other factors may affect area utilization by this species (e.g., noise or presence of people), keeping suitable habitat may contribute to maintaining deer presence in the area and, therefore, deer availability for hunting. Regional strategies from the *Kamloops Land and Resource Management Plan* are to maintain at least 25% of forested area in thermal cover and to link thermal cover units together with suitable travel corridors, especially mature Douglas fir vets on ridges (Kamloops Interagency Management Committee, 1995).
	Clearing vegetation during sensitive breeding periods will be avoided, and work will be completed within timing windows as required and where possible. To reduce the impacts of habitat removal on reproducing individuals, habitat loss will be avoided during sensitive windows (rutting season, September and October).	This measure ensures that sensitive times for wildlife species are acknowledged and effects to these species will be minimized, ensuring wildlife populations are available for harvesting.	High By avoiding clearing vegetation and habitat removal during sensitive breeding periods, effects on reproduction cycles of hunted species and population sizes will be mitigated. If populations continue to reproduce, new individuals will be available for hunting.
	Mitigation and BMPs:		
	Prohibit employees and contractors from hunting while on shift.	A no-hunting policy for workers and contractors will reduce the potential for increased hunting pressure and maintain availability of wildlife populations for harvesting.	High No-hunting policies are an effective measure to limit hunting pressure caused by workers and contractors. The policies will be enforced and those who do not comply will be removed from the Project.
	General mitigation for all species with respect to noise includes the following measures: ensuring impulse events, such as blasting, will be limited to certain times of the day (blasting will not take place before 10 AM); considering noise ratings when selecting equipment; adjusting blasting configurations to minimize simultaneous blasting effects; optimizing the operation of equipment to minimize noise (e.g., reduced speed limits); optimizing the site layout to minimize noise impact (e.g., through use of natural screens such as buildings, facing away from relevant receptors, minimizing the need for mobile equipment to use their backup alarms); and applying noise dampening measures where possible, including conducting loud procedures indoors, where practical.	These measures will help ensure that sensitive times for wildlife species are acknowledged and effects to these species will be minimized ensuring wildlife populations are available for harvesting.	High By implementing a combination of measures to reduce noise generated by the Project, potential effects on availability of wildlife will be mitigated. Noise can deter wildlife from using an area, thus reducing their availability. Noise will be monitored to ensure thresholds for the protection of wildlife and human health are not exceeded.
	General mitigation to avoid direct mortality includes the following measures: vehicles will yield to wildlife observed along Project roads and the locations of observed wildlife will be communicated to the environmental manager; traffic will be minimized by providing a vehicle parking lot for staff and by shuttling mine personnel; speed limits and wildlife signage will be implemented; a specific height for roadside vegetation will be maintained to improve drivers' sight lines; habitat near roads will be modified to decrease suitability for badgers and their prey; training and education programs will be implemented to inform staff of sensitive sites to ensure they avoid accidental destruction of key areas; and guns and hunting activities by any mine employees or contractors will be banned onsite.	This mitigation measure would reduce wildlife mortality associated with traffic and vehicles, thereby ensuring that wildlife populations are available for harvesting.	Moderate Direct mortality of wildlife as a result of the Project can be significantly reduced by implementing a combination of measures. Incidents and mortality of events will be monitored to evaluate efficiency of the measures and implement adaptive management strategies as required.
	With respect to badgers, lands that are conducive to suitable badger habitat will be enhanced to provide better forage opportunities to badgers. Grassland habitat known to be used by badgers will be fenced off, livestock grazing will be controlled/minimized on lands during sensitive times, and consideration will be given to badger habitat conservation during strategic planning.	This measure will contribute to healthy habitats for badgers to ensure this species is available for harvest.	Moderate By implementing a combination of measures, availability of badgers in the Project area will be maintained. A total of 2,093 hectares (ha) has been identified as potentially suitable for restoration of grasslands, which are used by badgers. Monitoring presence of badger will

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	KAM has committed to additional mitigation measures to further reduce effects on grasslands. These are detailed in the document *Memorandum: Ajax Project – Summary of Round 1 Technical Working Group Comments and Responses – Terrestrial/Wildlife Mitigation* (ERM, 2016c) and include potential financial support of mitigation to decrease regional badger mortality pending finalized critical habitat and recovery strategy, and implementation of a program for grassland restoration to address the time lag of temporal losses of grasslands prior to reclamation. KAM has noted that they are committed to conducting a habitat quality assessment post-Environmental Assessment to further refine mitigation measures and restoration planning.		continue, among others means, through incidental observations and a DNA hair-snagging program (RISC, 2007).
	With respect to grouse, in the Decommissioning and Closure Phase, grouse habitat will be restored through reclamation and re-vegetation processes. Existing riparian zones along Peterson Creek and other nearby areas will be enhanced to provide suitable winter habitat. Reclaimed aspen groves may also provide feeding and security habitat for both species of grouse, once an appropriate structural stage is reached.	This measure will contribute to healthy habitats for grouse to ensure this species is available for harvest.	<u>Moderate</u> Restoration of grouse habitat will likely increase availability of grouse during the Decommissioning and Closure Phase. The surface of grassland is expected to increase compared to pre-mining conditions. A total of 2,093 ha has been identified as potentially suitable for restoration of grasslands.
	The Wildlife and Vegetation Monitoring Plan (WVMP) (Section 11.27) The WVMP includes measures to avoid badger mortality and protect burrows during construction and operation of the Project. KAM has committed to additional mitigation measures to further reduce effects on grasslands. These are detailed in the document *Memorandum: Ajax Project – Summary of Round 1 Technical Working Group Comments and Responses – Terrestrial/Wildlife Mitigation* (ERM, 2016c) and include potential financial support of mitigation to decrease regional badger mortality pending finalized critical habitat and recovery strategy and implementation of a program for grassland restoration to address the time lag of temporal losses of grasslands prior to reclamation.	Implementation of Best Achievable Control Technology or management practices will monitor badger population health and ensure their availability in the Project area.	<u>Moderate</u> By protecting badger burrows and outlining measures to avoid direct mortality of badgers, effects on their populations can be mitigated. The effectiveness of these mitigations will be monitored by recording incidental observations, breeding evidence, mortality events and/or interactions with Project infrastructure; and monitoring suitable treatment (i.e., close to the Project) and control sites (i.e., away from potential impacts due to the Project) that will be monitored using provincial Resources Information Standards Committee (RISC) methods or other approved methods. Adaptive management will be implemented if local-area effects are reported for a wildlife VC, such as badgers.
	Traffic and fugitive dust effects will be reduced by implementing the Transportation Management Plan and the Access Management Plan (Sections 11.20 and 11.21). The Transportation Management Plan (Section 11.20) includes the following measures to manage traffic and minimize environmental impact: industry-recognized design criteria and construction management practices for access improvement works (including compliance with other Environmental Management and Monitoring Plans); commuting trip demand reduction through: car or vanpooling, bus staging, and staggering of shifts; heavy vehicle routing, including implementation of two-way radio communication and control processes to manage traffic movement as required; on- and off-site parking management for commuting staff; and spill containment and sediment control practices. The purpose of the Access Management Plan (Section 11.21) is to ensure that KAM manages and maintains access to the Project site to ensure the health and safety of KAM workers, contractors, the public and special interest groups, as well as to address safe and effective management of access to Jacko Lake.	Traffic management practices will reduce wildlife vehicle collisions, maintain wildlife habitats and resources available for harvest.	<u>High</u> The deposition of dust can alter the quality of habitat used by wildlife and therefore indirectly affect their availability. Some species will be more susceptible, such as amphibians, to the effect of dust deposition. A combination of mitigation measures will contribute to reducing fugitive dust. It can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	The Air Quality Monitoring and Dust Control Plan (Section 11.6) will also reduce the potential for negative effects of dust. This Plan includes measures to reduce emissions and dust that could deposit on water and land surfaces.	Dust control practices will maintain wildlife habitats and resources available for harvest.	<u>High</u> The Plan can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	A supplemental submission was developed that provides more detail related to how dust mitigation measures will be implemented. This is documented in *Memorandum: Management of Fugitive Dust* (KAM, 2016a). As outlined in this Plan, KAM will implement both preventative procedures and reactive control measures in order to minimize dust emissions from the Project. Some key examples include: • Daily visual inspections of the TSF and active haul roads; • Application of water to the tailings beach and haul roads; • Application of dust suppressants on the TSF tailings beach and haul roads; • Application of surfactants to the haul roads; • Rotation of tailing spigot points; and • Use of polymers in the tailings thickening process and direct application to the tailings beach, when required.		duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	The Soil Salvage and Handling Plan and the Landscape Design and Restoration Plan (Sections 11.3 and 11.26, respectively), as well as the Invasive Species Management Section in the Invasive Plants Management Plan (Section 11.17) and a vehicle wash station at site entrance may help to reduce the impact of invasive plants.	Implementation of Best Achievable Control Technology or management practices will maintain wildlife habitats and resources available for harvest.	<u>Moderate</u> By implementing a combination of measures, the establishment of invasive species can be managed, but it cannot be completely avoided. Therefore, the overall effectiveness was rated as moderate. However, the effectiveness of the measures will be monitored and invasive species already on site or introduced will be removed. Important measures to prevent the establishment of invasive species are minimization of disturbance and reclamation of the disturbed areas.
	A Noise and Vibration Management Plan (Section 11.22) will be developed with the objective of ensuring that noise levels during all phases of the Project are acceptably low for human and wildlife receptors, as per human health guidelines.	Implementation of Best Achievable Control Technology or management practices will maintain wildlife habitats and resources available for harvest.	<u>High</u> By implementing a combination of measures to reduce noise generated by the Project, potential effects on availability of wildlife will be mitigated. Noise can deter wildlife from using an area, thus potentially reducing their availability for hunting. Since noise thresholds identified for human annoyance are lower than those identified for wildlife receptors (e.g., noise threshold human 50 dBA, migratory birds 120 dBA, raptors 140 dBA), maintaining noise levels as per human health guidelines may be effective at also mitigating noise effects on wildlife.
	<u>Compensation:</u>		
	KAM will increase grassland and open forest restoration and support and encourage conservation land acquisition to compensate for badger habitat losses. KAM has committed to additional mitigation measures to further reduce effects on grasslands. These are detailed in the document *Memorandum: Ajax Project – Summary of Round 1 Technical Working Group Comments and Responses – Terrestrial/Wildlife Mitigation* (ERM, 2016c). KAM has noted that they are committed to conducting a habitat quality assessment post-Environmental Assessment to further refine mitigation measures and restoration planning.	Contributing to healthy habitats for badgers will ensure this species is available for harvest.	<u>High</u> By implementing habitat restoration for badgers and encouraging land acquisition, effects on badger habitat losses, and therefore availability of badgers, will be mitigated. A total of 2,093 ha have been identified as potentially suitable for restoration. The presence of badgers will be monitored by recording of incidental observations, breeding evidence, mortality events and/or interactions with Project infrastructure; and monitoring suitable treatment (i.e., close to the Project) and control sites (i.e., away from potential impacts due to the Project) that will be monitored using provincial RISC methods, or other approved methods. Adaptive management will be implemented if local-area effects are reported for a wildlife VC, such as badgers.
	KAM has noted that they recognize the importance of preserving sensitive habitat features for provincially Red- and Blue-listed species. New lek locations will be created to compensate for the one active lek that will be removed. As the success of lek creation is not well known, two potential lek sites will be created for every known lek removed.	Contributing to healthy habitats for grouse will ensure this species is available for harvest. As the success of lek creation is not well known, two potential lek sites should be created for every known lek removed. As the success of recreating lekking grounds is not well understood, combined with the Blue-listing of the species and the sensitive nature of leks, a residual effect is expected for habitat loss	<u>Low</u> As the success of recreating lekking grounds is not well understood, combined with the Blue-listing of the species and the sensitive nature of leks, a residual effect is expected for habitat loss on Columbian sharp-tailed grouse and additional research and monitoring will be required to gather information of the effectiveness of this mitigation measure.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
		on Columbian sharp-tailed grouse and additional research and monitoring will be required to gather information of the effectiveness of this mitigation measure.	
Change in access or use of preferred hunting areas	Appropriate signage will indicate blasting times and restricted areas.	Signage will inform hunters at Jacko Lake about appropriate times to access lands for harvest.	High Informing about blasting times will facilitate hunters' planning their access to the area at the most appropriate times to avoid blasting disturbances.
	Traffic will be reduced by implementing the Transportation Management Plan (Section 11.20). The following measures to manage traffic and minimize environmental impact are included: industry-recognized design criteria and construction management practices for access improvement works; commuting trip demand reduction through car or vanpooling, bus staging, and staggering of shifts; heavy vehicle routing, including implementation of two-way radio communication and control processes to manage traffic movement as required; on- and off-site parking management for commuting staff; and spill containment and sediment control practices. Supporting actions include: employment contract incentives for participation in initiatives to reduce travel demand; workplace travel planning; and community information, reporting, and feedback programs.	Traffic management practices will ensure access to traditional harvesting locations.	High The access to the area for hunting will be less affected if traffic caused by the Project is reduced, which will result in increased road safety and decreased disruptions and delays compared to conditions if traffic is not controlled.
Change in the experience of using land and resources (sensory disturbances)	Noise mitigation by Project design includes the following measures: conveyor from crusher to plant will be covered to reduce noise emission; enclosed heavy equipment such as mills, secondary crusher, compressors, pumps, and motors will be located inside buildings; roads will be designed to minimize haul distances; large trucks will be used for ore and waste transport to minimize the number of trips required between the source and destination; and the mobile equipment will be equipped with the manufacturer-recommended exhaust mufflers (Section 10.5).	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High By implementing a combination of measures to reduce noise generated by the Project, noise levels will be maintained within target thresholds and will not prevent users of the area to undertake traditional activities. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of fish and human health are not exceeded.
	Conduct blast design to minimize sensory disturbances to harvesters (Section 10.5). Mitigation measures include blast designs that minimize the amount of explosives detonated simultaneously, use of delays between detonations, and reduction of blast-hole diameters.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High Limiting noise from piling activities will contribute to maintaining the noise levels in the area to a level that will not prevent traditional activities from being undertaken. Noise levels will be maintained within guidelines for human health.
	Limit the use of vehicle horns during each shovel and haul truck loading cycle (Section 10.5).	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	Moderate Reducing to a minimum the frequency of vehicles horns emitted during daily hauling operations will contribute to maintaining the noise levels in the area to a level that will not prevent traditional activities from being undertaken. Noise levels will be maintained within guidelines for human health.
	Use multi-passenger vehicles to transport crews to and from job sites to reduce overall traffic noise emission (Section 10.5).	This measure will reduce the number of vehicles on the roads, reducing traffic noise and emissions.	High Reducing traffic noise will contribute to maintaining the noise levels in the area to a level that will not prevent traditional activities from being undertaken. Noise levels will be maintained within guidelines for human health.
	Conduct piling activities only during the daytime period (Section 10.5).	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High Limiting noise from piling activities will contribute to maintaining the noise levels in the area to a level that will not prevent traditional activities from being undertaken. Noise levels will be maintained within guidelines for human health.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Noise mitigation and noise management plan (Section 10.5) This Plan includes measures to mitigate noise during all phases of the Project. General measures include the following: limit the use of vehicle horn during each shovel and haul truck loading cycle to the extent allowed by safety regulations; operate vehicles within the posted maximum speed limits to reduce noise emission; use multi-passenger vehicles to transport crews to and from job sites to reduce overall traffic noise emission; conduct piling activities only during the daytime period; select best achievable technology (technology that can achieve lower noise emissions and that has been shown to be economically feasible through commercial application) for mine fleet equipment; maintain vehicles in good operating condition to meet emission standards (especially with exhaust silencers/mufflers); etc.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High By implementing a combination of measures to reduce noise generated by the Project, noise levels will be maintained to a level that will not prevent traditional activities from being undertaken. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded.
	Vibration management plan for blasting activities (Section 10.5) This Plan includes measures to mitigate vibration during each phases of the Project. Measures applicable to all phases include: apply proper field, planning and engineering controls during blast activities as summarized in the Noise and Vibration Technical Data Report (Appendix D Blast Review, Conclusions and Recommendations Appendix 10.5-A); manage and revise the controllable blast design parameters (i.e., confinement, charge length and diameter, charge decoupling, direction of initiation, and total shot duration) on an ongoing basis as needed during the Operation Phase; monitor ground vibrations and correlate with blast design predictions to determine if changes to blast design or procedures are necessary to reduce vibration; etc.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High Implementation of a blast design that considers not blasting at preferred fishing times, particularly during seasonal spring trout fishery, is an effective measure to mitigate blasting disturbance to fishers. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded.
	To reduce visual disturbances, progressive re-vegetation of Project components and other disturbed areas will be conducted on an ongoing basis during Construction and Operation phases, with larger Project components further re-vegetated at Decommissioning and Closure (Section 8.3). Successful vegetation establishment will enhance the aesthetics of the area.	This measure provides for the rapid re-vegetation of all temporarily disturbed areas and will use appropriate seed mixes that minimize the spread of invasive plants	Moderate Revegetation of disturbed areas in an effective way to enhance the aesthetics and natural aspect of the area although it requires time. The effectiveness of this measure increases as vegetation establishes in more areas overtime, through progressive revegetation. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good.
	Employ good visual design principles (Section 8.3) The visual design of the Project will consider local and regional landscape patterns and geometry (e.g., slope) in order to meet the needs of the resource values of the surrounding area, including economic, recreational and social values. Opportunities include: selecting plants for revegetation to match surrounding areas; sloping the Project components similarly to surrounding geomorphic characteristics; avoiding straight edges and instead contouring to form “ridges” or “valleys” when possible; among others.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	High Designing elements of the Project to mimic as much as possible the natural landforms, relief and vegetation of the area is an effective way to reduce the visual contrast caused by Project disturbances in the landscape.
	Infrastructure aesthetics will consider use of non-reflective materials in the construction of buildings and other infrastructure.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	Low This measure will contribute to reducing the visual contrast of the Project with the surrounding environment.
	Infrastructure will be painted with natural colours that blend into the landscape or will be screened with tall shrubs or trees.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	Low This measure will contribute to reducing the visual contrast of the Project with the surrounding environment.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	During the Post-Closure Phase, the re-vegetation of the large Project components will be monitored to ensure that the vegetation is taking hold and growing in a manner sufficient to mimic the surrounding landscape.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects to those practicing traditional uses of the lands.	Moderate Revegetation of disturbed areas in an effective way to enhance the aesthetics and natural aspect of the area. The effectiveness of this measure increases as vegetation establishes in more areas overtime, through progressive revegetation. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good.
Changes in the quality of the harvested resources	Haul-road-associated dust will be mitigated by using coarse gravel and aggregate material on road beds and minimizing haul distances.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	High Implementing a combination of mitigation measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	Other operational mitigation measures include watering haul roads, reducing idling of vehicles and equipment, and maintaining mobile equipment to meet emission standards.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	High Implementing a combination of mitigation measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	Implement design mitigation measures such as the installation of covers over coarse- and fine-ore stockpiles.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	High Implementing a combination of mitigation measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	Implement dust collectors and the use of covered concentrate transport trucks.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	High Implementing a combination of mitigation measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	To minimize contamination of harvested species through potential ingestion of contaminated water, a SWQMMP (Section 11.23), a GWQMMP (Section 11.24) and a Water Management and Hydrometric Monitoring Plan (Section 11.7) will be implemented. The SWQMMP (Section 11.23) includes measures to prevent changes in surface water quality and flow that may negatively impact aquatic life in Jacko Lake and Peterson Creek upstream and downstream of Jacko Lake. The GWQMMP (Section 11.24) includes measures to protect groundwater quality from seepage and runoff down-gradient of Project facilities in the Peterson Creek watershed. The Water Management and Hydrometric Monitoring Plan (Section 11.7) includes: • Construction of four new dams on Jacko Lake; • Removal of the existing dam and low-level outlet on Jacko Lake;	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	Moderate to High By implementing a combination of measures, effects on surface water quality will be mitigated. To ensure effectiveness of the mitigation measures, the SWQMMP details procedures for monitoring surface water quality and ensure, among others, that parameters listed in the *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CCME, 1999) are met, above which additional monitoring and/or mitigation strategies may be triggered. This guideline presents thresholds values for water parameters such temperature, dissolved oxygen, turbidity, pH, nutrients, metals and organics within a range suitable for maintaining healthy populations of fish and other aquatic organisms. Monitoring will be implemented with a focus on assessing for changes in surface water quality compared to baseline and predicted concentrations, water quality guidelines and site-specific water- quality benchmarks. By implementing a combination of measures, effects on groundwater quality will be mitigated, contributing to maintaining fish availability. To ensure effectiveness of the mitigation measures, the Groundwater Flow Model incorporated sensitivity analyses that help to evaluate their effectiveness, as well as other sources of uncertainty in the models. For example, the groundwater flow scenarios show that the majority of seepage pathways from the TSF and MRSFs are to the Open Pit; however, all scenarios have some seepage

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	• Construction of the Peterson Creek Diversion System, which will allow for inflows into Jacko Lake to be discharged to an open channel and culvert south of the Open Pit, then re-introduced to Lower Peterson Creek immediately downstream of the Central Pond; • Temporary abandonment of the Lower Peterson Creek channel between the inlet of the Peterson Creek Diversion System culvert and the eastern extent of the Open Pit for the Operation Phase (this channel would be re-established during Closure and Decommissioning); and • Construction of a new pond, the Central Pond, within Lower Peterson Creek adjacent to the Open Pit. Mitigation measures for flow reductions in Peterson Creek will be implemented to ensure that existing water license requirements are met.		pathways that eventually reach the receiving environment in Peterson Creek (ERM 2016a). The GWQMMP relies on monitoring to verify the mitigation and management measures are adequate, perform as predicted in the effects assessment, and provide information for adaptive management if unanticipated effects on groundwater are discovered. Groundwater quality results will be compared against baseline ranges for each monitoring well, as well as generic water quality guidelines. For most parameters, action triggers will be developed for monitoring results that exceed generic water quality guidelines specific to the downstream users.
	<u>Other management plans to protect harvested species from contamination include the following:</u>		
	Construction Waste Management Plan (Section 11.4) This Plan includes measures to handle, storage and dispose of solid waste during construction of the Project.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	<u>High</u> Managing solid waste is an indirect measure to protect the quality of resources by preventing non-hazardous waste and putrescible food from reaching the land and waterbodies and contaminating wildlife habitat during construction of the Project.
	ML/ARD Management and Monitoring Plan (Section 11.5) Description: The purpose of the ML/ARD Management Plan is to formulate a series of operational procedures and closure activities that will avoid the development of acidic drainage from the Project MRSFs, TSF and ore stockpiles and minimize the impact of neutral metal leaching to the receiving environment from these facilities. Management strategies specific to the Project include: • Locate MRSFs to areas east and south of the Open Pit to increase distance from the City of Kamloops and facilitate collection of seepage; • Segregate high-risk versus low-risk rock types in the pit; • Blend PAG and NPAG materials in proportions appropriate to prevent ARD onset; • Construct an NPAG base for the blended MRSFs; • Limit infiltration by the implementation of a cover; • Minimize East MRSF size and construct it only of NPAG material to limit seepage over the Peterson Creek Aquifer; • Peterson Creek Diversion constructed to limit the quantity of contact water discharging to Peterson Creek; • In-pit backfill contains seepage and prevents discharge to receiving water streams; and • Use liner systems in the TSF where tailings are in contact with embankments to limit infiltration of tailings pore water.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	<u>High</u> By implementing a combination of measures to prevent development of acidic drainage, negative effects on water quality (e.g., changes in pH and concentration of metals), and therefore on wildlife can be mitigated. Effective mitigation is achieved by addressing geochemical, hydrological and geotechnical factors of risks (BC MEM, 1998) through a diversity of measures. For example, blending PAG and NPAG mine rock might be an effective measure to prevent generation of acid drainage when comprehensive material characterization, waste design and construction plans are supported by detailed prediction information (BC MEM, 1998). Similarly, the use of a cover on waste rock piles is an effective measure to reduce water infiltration although quantification of effectiveness (e.g., 80% of infiltration prevented by a soil cover) depends on final design criteria. To ensure effectiveness of the mitigations, monitoring will include: in-pit monitoring and sampling (e.g., ore identification and management, segregation of PAG and NPAG mine rock), seepage and tailings slurry water quality monitoring, and commissioned of on-site laboratory.
	Contaminated Sites Management Plan (Section 11.8) This Plan includes a framework to investigate potential contamination on a site during Project life and remediate accordingly, protecting soil, water and air quality.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	<u>High</u> By detecting and remediating any contamination caused by the Project, the potential impacts to the quality of wildlife harvested (e.g., contaminated meat) will be significantly mitigated. The *Contaminated Sites Regulation* provides numerical and risk-based standards to determine when cleanup is needed and satisfactorily completed.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Solid Waste Management Plan (Section 11.9) This Plan includes measures to handle, storage and dispose of solid waste during operation of the Project.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	High Managing solid waste is an indirect mitigation measure to protect the quality of resources by preventing non-hazardous waste and putrescible food from reaching the land and waterbodies used by wildlife during operation of the Project.
	HWMP (Section 11.10) This Plan includes measures for classifying, handling, storing, transporting and disposing of hazardous waste materials that could impact quality of resources during construction, operation and closure.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	High Reducing the risk of wildlife's exposure to hazardous waste is an important measure to preserve the quality of resources for hunting. To ensure effectiveness of the mitigation measures, the HWMP relies on monitoring to ensure storage, movements and treatment of hazardous waste meet performance objectives and regulatory guidelines. Monitoring will include documentation of each shipment to ensure traceability; inspections of hazardous waste storage areas, landfarm, and oil water separator; among others.
	RMP (Accidents and Malfunctions) (Section 11.12) This Plan includes measures for early detection of major risks, risk reduction, loss control and strategies to minimize the effects on the environment, including fish habitat. The risks of major concern that warrant specific environmental protection measures are failure of the pit wall adjacent to Jacko Lake and failure of the TSF through dam break and inundation. The mitigation measures included in the Plan are of proactive/preventative nature and include design measures to prevent pit wall failure and TSF dam breach. For example, the TSF includes several design features that significantly improve embankment stability and protect against downstream slope failures that could lead to a breach. These are a mine rock buttress and/or MRSF included on the downstream side of the northern and eastern embankments to increase the Factor of Safety against a breach several times higher than the minimum design requirement; additional freeboard allowance for Probable Maximum Flood conditions and wave-run up for all stages of dam development; an absence of continuous weak layers that could adversely impact dam foundation stability; and the supernatant pond located several hundred metres from the dam (post start-up).	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	High By preventing accidents and malfunctions, negative effects to the quality of resources in the area, including wildlife, will be mitigated. To ensure effectiveness of the measures proposed, the RMP relies on monitoring the risk protection measures incorporated in the engineering design of the Project, fundamentally of the pit wall adjacent to Jacko Lake and of the structural integrity of the TSF. A Quantitative Risk Assessment of dam breach risk is envisaged and additional mitigation measures will be evaluated for inclusion in the next stage of design.
	Natural Hazards Management Plan (Section 11.13) The Natural Hazards Management Plan provides a framework to identify, assess, monitor and manage risks associated with natural hazards such as terrain stability, seismic events or floods on Project infrastructure, thus minimizing potential effects to the receiving environment.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	High By identifying potential natural hazards and verifying the Project design is adequate to withstand them (e.g., simulation of 1-in-475 year earthquake to determine if it would affect integrity of the facilities), potential negative effects to the quality of traditional resources, including wildlife, will be mitigated. To verify effectiveness of the protection strategy, stability monitoring is a key component. For example, for the Open Pit, the slope stability will be constantly monitored through a combination of Automated Total Station Networks, non-reflective LiDAR (Light Detection and Ranging) scanning, Slope Stability Radar (SSR), Global Positioning System (GPS), and vibrating wire piezometers. The Automated Total Station Networks and SSR will enable real-time monitoring, which can be alarmed to provide immediate indication of possible slope instability and enable appropriate response.
	ERP (Section 11.14) The ERP includes measures and procedures to address emergencies, that is, situations that immediately threaten the well-being of people and the environment, emphasizing containment, notification and mobilization to deal with the emergency (e.g., wildlife encounters and incursions, seismicity, and water or tailings management failure).	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	High By implementing the measures and procedures outlined in the ERP, it would be possible to quickly address and contain risks associated with specific emergencies, thus limiting negative effects on the environment.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
Plant Gathering Opportunities and Practices			
Change in the availability of species harvested	Avoidance:		
	During Project planning, specific mine footprints were redesigned to ensure the minimum possible effects on the surrounding habitat. As a result of concerns about potential effects to the Cherry Creek watershed, KAM relocated the TSF away from the Alkali Creek watershed (including Cherry Creek). The location and redesign to a conventional TSF reduces potential for dust by using wet tailings storage methods. As a result of concerns raised with respect to Inks Lake (an area widely used by waterfowl, other wildlife and Aboriginal Groups) the updated General Arrangement no longer directly overlaps Inks Lake.	Redesign of the Project footprints will minimize effects to habitat.	High Avoidance of alteration or change to an area is the most effective measure to prevent negative effects to its components. By re-designing the mine footprints, the loss of plants in Cherry Creek and Inks Lake was avoided, thereby preserving the areas for plant gathering.
	Maps and a spatial database of known rare plant locations in the vicinity of Project facilities will be maintained and consulted to avoid impacts during operation and maintenance activities. Ongoing monitoring by a Qualified Environmental Professional or Project Environmental Manager will occur. The database should be actively updated as new information becomes available.	Implementation of Best Achievable Control Technology or management practices according to BMPs.	High By keeping records and maps of locations of rare plants, and avoiding these locations, availability of rare plants will remain in the Project area.
	Exclusion areas will be created at all known rare plant occurrences located adjacent to construction and operation areas. These areas will be clearly flagged to discourage accidental encroachment with machines. Signage will be added where necessary to indicate the boundaries of the exclusion area.	Avoidance of sensitive plant occurrences will ensure that habitat and, therefore, rare and traditional use plant populations are available for harvesting.	High Avoidance of alteration or change to an area is the most effective measure to prevent negative effects on its components. Demarcation of exclusion areas will be effective at limiting mortality of rare plants caused by direct disturbances of the area (e.g., plant damage or death by crushing).
	Roads and transmission lines will be designed to minimize the number of water crossings and to avoid running parallel to watercourses. They will also be designed to minimize the removal of known rare plant occurrences.	Avoidance of sensitive plant occurrences will ensure that habitat and, therefore, rare and traditional use plant populations are available for harvesting.	High Riparian areas and wetlands are important habitat for rare plants and traditional plants (e.g., willows, cattail). By minimizing water crossings and avoiding constructing roads to run parallel to watercourses, loss of rare plant habitat and plant availability will be mitigated.
	BMPs:		
	Known rare plant occurrences will be used as inputs during the final design and Construction Phase. Where feasible, the Project footprint will be placed to avoid direct impacts to these occurrences.	Redesign of the Project footprints will minimize effects to habitat.	High Loss of rare plant availability can be mitigated by re-designing the Project footprint to avoid destructing areas of rare plant occurrences.
	Construction personnel will attend a field-based orientation session where the exclusion areas will be explained, and avoidance of these areas will be mandatory.	Mine personnel will be educated to maximize importance and understanding of sensitive habitats and procedures to reduce effects.	High Avoidance of alteration or change to an area is the most effective measure to prevent negative effects to its components. Demarcation of exclusion areas will be effective at limiting mortality of rare plants caused by direct disturbances of the area (e.g., plant damage or death by crushing). The policy to avoid these areas will be enforced by KAM. Construction personnel who do not abide by this policy will be removed from the Project.
	Erosion prevention and bank stabilization techniques will be used (Section 11.2). Soil degradation and erosion control mitigation is explained in the ESCP (Section 11.2). The ESCP has been established to manage mitigation approaches designed to prevent or minimize erosion and contain sediment within the mine site. The environmental protection measures associated with mitigation of erosion and sedimentation focus on: • Incorporation of erosion and sedimentation control into design and planning (e.g., minimize disturbance, progressive reclamation);	Implementation of Best Achievable Control Technology or management practices will reduce habitat losses and maintain traditional plant availability.	High By limiting soil erosion and achieving bank stabilization, degradation of plant habitat in the surrounding areas can be mitigated. To ensure effectiveness of the mitigation measures, the ESCP relies on continuous monitoring to verify that the management practices are adapted to local conditions, are properly executed, and, if needed, more detailed site-specific prescriptions are completed. For example, areas affected by erosion will be mapped and information including erosion type, intensity, the extent of the affected area, site UTM coordinates, and existing control measures and an assessment of their performance, will be documented. Affected sites will be regularly checked for evidence of erosion, particularly after rainfall events, until erosion is not a concern. Monitoring results will be used to trigger an appropriate adaptive management response. The effectiveness of

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	• Application of erosion control BMPs (e.g., re-contouring stockpiles of soil and overburden to a 2H:1V slope and seeding for erosion control); • Application of sediment and runoff control BMPs (e.g., minimizing the area of exposed soils, timely seeding and planting, and the use of erosion control measures appropriate to the soil erodibility potential in TSF); and • Monitoring and maintenance (e.g., sediment control and runoff management structure functionality will be maintained by removing sediment captured in traps before it exceeds 15% loss of trap capacity).		the ESCP will be assessed regularly (at least annually). The reviews will reflect changes in environmental requirements, technology and operational procedures.
	For those rare plant occurrences that cannot be avoided, transplantation of these rare plants will be considered based upon guiding principles.	Implementation of Best Achievable Control Technology or management practices according to BMPs described in Provincial protocols: *Guidelines for Translocation of Plant Species at Risk in British Columbia*.	Moderate Transplanting rare plants from areas to be disturbed will mitigate their mortality and keep their availability elsewhere. However, effectiveness of the mitigation will depend upon survival of transplanted plants. A broad range of survival rates can be expected (10-90%) depending on target species and correct implementation of transplanting techniques. KAM has noted that they look forward to working with Aboriginal Groups on the implementation of this strategy.
	KAM will support regional rare plant surveys and research to determine the distribution of these rare plant species throughout the Regional Study Area.	Collection of additional and up-to-date data will ensure sensitive plants are protected to the greatest degree possible.	High By supporting rare plant surveys and research, new knowledge about their habitat preferences and distribution can be used to protect and recreate conditions in the Project area (e.g., during progressive reclamation) to mitigate and compensate loss of rare plants in the Project area.
	Mitigation measures to protect air quality are described in Section 10.1 and in the Air Quality Monitoring and Dust Control Plan (Section 11.6). A supplemental submission was developed that provides more detail related to how dust mitigation measures will be implemented. This is documented in *Memorandum: Management of Fugitive Dust* (KAM, 2016a). As outlined in this Plan, KAM will implement both preventative procedures and reactive control measures in order to minimize dust emissions from the Project. Some key examples include: • Daily visual inspections of the TSF and active haul roads; • Application of water to the tailings beach and haul roads; • Application of dust suppressants on the TSF tailings beach and haul roads; • Application of surfactants to the haul roads; • Rotation of tailing spigot points; and • Use of polymers in the tailings thickening process and direct application to the tailings beach, when required.	Implementation of Best Achievable Control Technology or management practices will reduce habitat losses and maintain traditional plant availability.	High Implementing a combination of mitigation measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system. Monitoring will identify changes in air quality in relation to guidelines and standards established by applicable Canadian and BC regulatory criteria.
	WVMP (Section 11.27) This WVMP includes monitoring of habitat loss and alteration due to Project footprint/activities; wildlife observations; Project-related mortality; vegetative health (metal uptake); rare plant occurrences/translocations; ecosystems; wetlands (amphibian breeding, migratory birds including waterfowl); bird and raptor nests; rock outcrops; and grasslands (grouse leks). The WVMP has been updated and the document is included in the Appendix of *Memorandum Ajax Project – Summary of Round 1 Technical Working Group Comments and Responses – Terrestrial/Wildlife Mitigation* (ERM, 2016c).	Implementation of Best Achievable Control Technology or management practices will reduce habitat losses and maintain traditional plant availability.	High Specific targets related to achieving the objectives are to meet legislation requirements with regard to wildlife; minimize loss of high-quality habitat; minimize wildlife mortality as a direct consequence of the Project; minimize the disruption to wildlife movement; and prevent disturbance to deer within high-rated habitat and designated and draft Ungulate Winter Range during winter.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Reduce traffic and fugitive dust effects by implementing the Transportation Management Plan and the Access Management Plan (Sections 11.20 and 11.21, respectively). The Transportation Management Plan (Section 11.20) includes the following measures to manage traffic and minimize environmental impact: industry-recognized design criteria and construction management practices for access improvement works (including compliance with other Environmental Management and Monitoring Plans); commuting trip demand reduction through: car or vanpooling, bus staging, and staggering of shifts; heavy vehicle routing, including implementation of two-way radio communication and control processes to manage traffic movement as required; on- and off-site parking management for commuting staff; and spill containment and sediment control practices. The purpose of the Access Management Plan (Section 11.21) is to ensure that KAM manages and maintains access to the Project site to ensure the health and safety of KAM workers, contractors, the public and special interest groups, as well as to address safe and effective management of access to Jacko Lake.	Implementation of Best Achievable Control Technology or management practices will reduce habitat losses and maintain traditional plant availability.	<u>High</u> The deposition of dust can alter the quality of plant habitat and, therefore, indirectly affect their availability. A combination of mitigation measures will contribute to reducing fugitive dust. It can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	The Soil Salvage and Handling Plan (Section 11.3), the Landscape Design and Restoration Plan (Section 11.26), the Invasive Plants Management Plan (Section 11.17) and a vehicle wash station at the site entrance may help to reduce the impact of invasive plants. Alteration of plant habitat as a result of invasive species will be mitigated with measures included in the following Environmental Plans: • The Soil Salvage and Handling Plan (Section 11.3) includes measures for adequate soil handling as well as erosion control on stockpiles, limiting transport of soil to the receiving environment; • The Landscape Design and Restoration Plan (Section 11.26) includes guidelines to construct geologically stable landforms with low rates of soil erosion, maintain acceptable water quality standards, mitigate aesthetic and environmental impacts, restore ecological functions, and meet end land-use objectives during operation and closure of the Project; and • The Invasive Species Management Plan (Section 11.17) includes measures to prevent and control change in species composition due to invasive species. A site-specific plan will be developed by the Project's Environmental Manager through discussion (as needed) with the Invasive Plant Council, environmental scientists and local governing agencies.	Implementation of Best Achievable Control Technology or management practices will reduce habitat losses and maintain traditional plant availability.	<u>Moderate</u> By implementing a combination of measures, the establishment of invasive species can be managed, but it cannot be completely avoided. Therefore, the overall effectiveness was rated as moderate. However, the effectiveness of the measures will be monitored and invasive species already on site or introduced will be treated. Important measures to prevent the establishment of invasive species are minimization of disturbance and reclamation of disturbed areas.
	The reclamation plan will prioritize the rapid re-vegetation of all temporarily disturbed areas and will use appropriate seed mixes that minimize the spread of invasive plants (Section 11.17). Prior to reclamation work commencing, surveys will be conducted to record populations of invasive species throughout the Local Study Area. This survey will identify high priority areas, and treatment will be initiated as required.	Implementation of Best Achievable Control Technology or management practices will reduce habitat losses and maintain traditional plant availability.	<u>Moderate</u> By implementing a combination of measures, the establishment of invasive species can be managed, but it cannot be completely avoided. Therefore, the overall effectiveness was rated as moderate. However, the effectiveness of the measures will be monitored and invasive species already on site or introduced will be treated.
	<u>Compensation:</u>		
	KAM will increase grassland and open forest restoration and support and encourage conservation land acquisition to compensate for habitat losses.	Contributes to healthy grassland and open forest habitats to ensure these areas are available for harvest.	<u>Moderate</u> By implementing grassland and open forest restoration, and encouraging land acquisition, effects on plant habitat losses and, therefore, their availability will be mitigated. A total of 2,093 ha have been identified as potentially suitable for restoration. Revegetation has been

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	KAM has committed to additional mitigation measures to further reduce effects on grasslands. These are detailed in the document *Memorandum: Ajax Project – Summary of Round 1 Technical Working Group Comments and Responses – Terrestrial/Wildlife Mitigation* (ERM, 2016c). KAM has noted that they are committed to conducting a habitat quality assessment post-Environmental Assessment to further refine mitigation measures and restoration planning.		successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good. Grass cover of 65% is considered suitable for restoration of sharp-tailed grouse habitat.
	KAM will implement further mitigation in the form of a compensation program. The objective of the compensation program will be to achieve like-for-like offsetting of wetland loss. Compensation efforts will initially focus on local wetlands, including enhancement around the verges of Jacko Lake. KAM has committed to additional mitigation measures to further reduce effects on wetlands. These are detailed in the document *Memorandum: Ajax Project – Summary of Round 1 Technical Working Group Comments and Responses – Terrestrial/Wildlife Mitigation* (ERM, 2016c). These include inclusion of ephemeral wetlands that will be lost into the Wetland Compensation Plan; completion of additional surveys to document wetland functions for ephemeral wetlands and wetlands for which *The Federal Policy on Wetland Conservation* applies (Government of Canada, 1991), and incorporation of these functions into wetland compensation planning.	Contributing to healthy habitats will ensure areas are available for harvest.	Moderate By implementing a wetland compensation program, loss of wetland plant species for traditional uses in the Project area will be mitigated and plants will remain available (e.g. willows, cattail).
Change in access or use of preferred plant gathering areas	Appropriate signage will indicate blasting times.	Signage will inform plant gatherers in the Jacko Lake area about appropriate times to access lands for harvest.	High Informing about blasting times will mitigate disturbances (e.g., noise and vibration) to traditional harvesters, who will be able to avoid accessing the area during these times.
	Reduce traffic by implementing the Transportation Management Plan (Section 11.20). The following measures to manage traffic and minimize environmental impact are included: industry-recognized design criteria and construction management practices for access improvement works; commuting trip demand reduction through: car or vanpooling, bus staging, and staggering of shifts; heavy vehicle routing, including implementation of two-way radio communication and control processes to manage traffic movement as required; on- and off-site parking management for commuting staff; and spill containment and sediment control practices. Supporting actions include: employment contract incentives for participation in initiatives to reduce travel demand; workplace travel planning; and community information, reporting, and feedback programs.	Traffic management practices will ensure access to traditional harvesting locations.	High The access to the area for plant gathering will be less affected if traffic caused by the Project is reduced, which will result in increased road safety and decreased disruptions and delays compared to conditions if traffic is not controlled.
Change in the experience of using land and resources (sensory disturbances)	General mitigation with respect to noise includes ensuring impulse events, such as blasting, will be limited to certain times of the day (blasting will not take place before 10 AM); considering noise ratings when selecting equipment; adjusting blasting configurations to minimize simultaneous blasting effects; optimizing the operation of equipment to minimize noise (e.g., reduced speed limits); optimizing the site layout to minimize noise impact (e.g., through use of natural screens such as buildings, facing away from relevant receptors, minimizing the need for mobile equipment to use their backup alarms); and applying noise dampening measures where possible, including conducting loud procedures indoors, where practical.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise to those practicing traditional uses of the lands.	High By implementing a combination of measures to reduce noise generated by the Project, noise levels will be maintained within target thresholds and will not prevent users of the area to undertake traditional activities. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of fish and human health are not exceeded.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Conducting blast design to minimize sensory disturbances to harvesters (Section 10.5). Mitigation measures include blast designs that minimize the amount of explosives detonated simultaneously, use of delays between detonations, and reduction of blast-hole diameters. No blasts will be detonated at the streambed/water interface. Noise and vibration will be monitored to ensure thresholds for the protection of fish are not exceeded.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise to those practicing traditional uses of the lands.	High Implementation of a blast design is an effective measure to mitigate blasting disturbance to plant gatherers and maintain noise levels within target thresholds that will not prevent users of the area to undertake traditional activities. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded.
	Use multi-passenger vehicles to transport crews to and from job sites to reduce overall traffic noise emission (Section 10.5).	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High Reducing traffic noise will contribute to maintaining the noise levels in the area to a level that will not prevent traditional activities from being undertaken. Noise levels will be maintained within guidelines for human health.
	Noise mitigation and noise management plan (Section 10.5) This Plan includes measures to mitigate noise during all phases of the Project. General measures include the following: limit the use of vehicle horn during each shovel and haul truck loading cycle to the extent allowed by safety regulations; operate vehicles within the posted maximum speed limits to reduce noise emission; use multi-passenger vehicles to transport crews to and from job sites to reduce overall traffic noise emission; conduct piling activities only during the daytime period; select best achievable technology (technology that can achieve lower noise emissions and that has been shown to be economically feasible through commercial application) for mine fleet equipment; maintain vehicles in good operating condition to meet emission standards (especially with exhaust silencers/mufflers); etc.	This measure will reduce the number of vehicles on the roads, reducing traffic noise and emissions.	High By implementing a combination of measures to reduce noise generated by the Project, noise levels will be maintained to a level that will not prevent traditional activities from being undertaken. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded.
	Vibration management plan for blasting activities (Section 10.5). This Plan includes measures to mitigate vibration during each phase of the Project. Measures applicable to all Phases include: apply proper field, planning, and engineering controls during blast activities as summarized in the Noise and Vibration Technical Data Report (Appendix D Blast Review; Conclusions and Recommendations Section 8.0 in Appendix 10.5-A); manage and revise the controllable blast design parameters (i.e., confinement, charge length and diameter, charge decoupling, direction of initiation, and total shot duration) on an ongoing basis as needed during the Operation Phase; monitor ground vibrations and correlate with blast design predictions to determine if changes to blast design or procedures are necessary to reduce vibration; etc.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise to those practicing traditional uses of the lands.	High Implementation of a blast design that considers minimizing vibration from blasting is an effective measure to mitigate blasting disturbance to plant gatherers. Vibration will be maintained to a level that will not prevent traditional activities from being undertaken. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded.
	To reduce visual disturbances, progressive re-vegetation of Project components and other disturbed areas will be conducted on an ongoing basis during Construction and Operation phases, with larger Project components further re-vegetated at Decommissioning and Closure (Section 8.3). Successful vegetation establishment will enhance the aesthetics of the area.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	Moderate Revegetation of disturbed areas in an effective way to enhance the aesthetics and natural aspect of the area. The effectiveness of this measure increases as vegetation establishes in more areas overtime, through progressive revegetation. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Employ good visual design principles (Section 8.3). The visual design of the Project will consider local and regional landscape patterns and geometry (e.g., slope) in order to meet the needs of the resource values of the surrounding area, including economic, recreational and social values. Opportunities include: selecting plants for revegetation to match surrounding areas; sloping the Project components similarly to surrounding geomorphic characteristics; avoiding straight edges and instead contouring to form “ridges” or “valleys” when possible; among others.	This measure provides for the rapid re-vegetation of all temporarily disturbed areas and will use appropriate seed mixes that minimize the spread of invasive plants.	High Designing elements of the Project to mimic as much as possible the natural landforms, relief and vegetation of the area is an effective way to reduce the visual contrast caused by Project disturbances in the landscape.
	Infrastructure aesthetics will consider the use of non-reflective materials in the construction of buildings and other infrastructure.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects to those practicing traditional uses of the lands.	Low This measure will contribute to reducing the visual contrast of the Project with the surrounding environment.
	Infrastructure will be painted with natural colours that blend into the landscape or will be screened with tall shrubs or trees.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	Low This measure will contribute to reducing the visual contrast of the Project with the surrounding environment.
	During the Post-Closure Phase, the re-vegetation of the large Project components will be monitored to ensure that the vegetation is taking hold and growing in a manner sufficient to mimic the surrounding landscape. It is anticipated that Aboriginal Groups will be engaged in these monitoring activities. Successful vegetation establishment will enhance the aesthetics of the area.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	Moderate Revegetation of disturbed areas in an effective way to enhance the aesthetics and natural aspect of the area. The effectiveness of this measure increases as vegetation establishes in more areas overtime, through progressive revegetation. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good.
Changes in the quality of the harvested resources	Haul-road-associated dust will be mitigated by using coarse gravel and aggregate material on road beds and minimizing haul distances.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	High Implementing a combination of mitigation measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	Other operational mitigation measures include watering haul roads, reducing idling of vehicles and equipment, and maintaining mobile equipment to meet emission standards	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High Implementing a combination of mitigation measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	Implement design mitigation measures, such as installation of covers over coarse- and fine-ore stockpiles.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High Implementing a combination of mitigation measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	Implement dust collectors and the use of covered concentrate transport trucks.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High Implementing a combination of mitigation measures can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	To minimize contamination of harvested species through potential absorption of contaminated water, a SWQMMP (Section 11.23), a GWQMMP (Section 11.24) and a Water Management and Hydrometric Monitoring Plan (Section 11.7) will be implemented. The SWQMMP (Section 11.23) include measures to monitor, assess and provide feedback to promptly address surface water quality in Jacko Lake and Peterson Creek upstream and downstream of Jacko Lake. The GWQMMP (Section 11.24) includes measures to protect, monitor and provide input related to groundwater quality down-gradient of Project facilities in the Peterson Creek watershed. The Water Management and Hydrometric Monitoring Plan (Section 11.7) includes: • Construction of four new dams on Jacko Lake; • Removal of the existing dam and low-level outlet on Jacko Lake; • Construction of the Peterson Creek Diversion System, which will allow for inflows into Jacko Lake to be discharged to an open channel and culvert south of the Open Pit, then re-introduced to Lower Peterson Creek immediately downstream of the Central Pond; • Temporary abandonment of the Lower Peterson Creek channel between the inlet of the Peterson Creek Diversion System culvert and the eastern extent of the Open Pit for the Operation Phase (this channel would be re-established during Closure and Decommissioning); and • Construction of a new pond, the Central Pond, within Lower Peterson Creek adjacent to the Open Pit. • Mitigation measures for flow reductions in Peterson Creek will be implemented to ensure that existing water license requirements are met.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	Moderate to High By implementing a combination of measures, effects on surface water quality will be mitigated. To ensure effectiveness of the mitigation measures, the SWQMMP details procedures for monitoring surface water quality and ensure, among others, that parameters listed in the *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CCME, 1999) are met, above which additional monitoring and/or mitigation strategies may be triggered. This guideline presents thresholds values for water parameters such temperature, dissolved oxygen, turbidity, pH, nutrients, metals and organics within a range suitable for maintaining healthy populations of fish and other aquatic organisms. Monitoring will be implemented with a focus on assessing for changes in surface water quality compared to baseline and predicted concentrations, water quality guidelines and site-specific water- quality benchmarks. By implementing a combination of measures, effects on groundwater quality will be mitigated, contributing to maintaining fish availability. To ensure effectiveness of the mitigation measures, the Groundwater Flow Model incorporated sensitivity analyses that help to evaluate their effectiveness, as well as other sources of uncertainty in the models. For example, the groundwater flow scenarios show that the majority of seepage pathways from the TSF and MRSFs are to the Open Pit; however, all scenarios have some seepage pathways that eventually reach the receiving environment in Peterson Creek (ERM 2016a). The GWQMMP relies on monitoring to verify the mitigation and management measures are adequate, perform as predicted in the effects assessment, and provide information for adaptive management if unanticipated effects on groundwater are discovered. Groundwater quality results will be compared against baseline ranges for each monitoring well, as well as generic water quality guidelines. For most parameters, action triggers will be developed for monitoring results that exceed generic water quality guidelines specific to the downstream users.
	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.		
	Construction Waste Management Plan (Section 11.4) This Plan includes measures to handle, storage and dispose of solid waste during construction of the Project.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High Managing solid waste is an indirect measure to protect the quality of resources by preventing non-hazardous waste and putrescible food from reaching the waterbodies and contaminating fish and fish habitat during construction of the Project.
	ML/ARD Management and Monitoring Plan (Section 11.5) This Plan includes measures to protect water quality in Peterson Creek and the Peterson Creek aquifer from ML/ARD.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High By implementing a combination of measures to prevent development of acidic drainage, negative effects on water quality (e.g., changes in pH and concentration of metals), and plants that come into contact with water, can be mitigated. Effective mitigation is achieved by addressing geochemical, hydrological and geotechnical factors of risks (BC MEM, 1998) through a diversity of measures. For example, blending PAG and NPAG mine rock might be an effective measure to prevent generation of acid drainage when comprehensive material characterization, waste design and construction plans are supported by detailed prediction information (BC MEM, 1998). Similarly, the use of a cover on waste rock piles is an effective measure to reduce water infiltration although quantification of effectiveness (e.g., 80% of infiltration prevented by a soil cover) depends on final design criteria. To ensure effectiveness of the mitigations, monitoring will include: in-pit monitoring and sampling (e.g., ore identification and management, segregation of PAG and NPAG mine

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
			rock), seepage and tailings slurry water quality monitoring, and commissioned of on-site laboratory.
	Contaminated Sites Management Plan (Section 11.8) This Plan includes a framework to investigate potential contamination on a site during Project life and remediate accordingly, to protect soil, water and air quality.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High By detecting and remediating any contamination caused by the Project, the potential impacts to the quality of wildlife harvested (e.g., contaminated meat) will be significantly mitigated. The *Contaminated Sites Regulation* provides numerical and risk-based standards to determine when cleanup is needed and satisfactorily completed.
	Solid Waste Management Plan (Section 11.9) This Plan includes measures to handle, storage and dispose of solid waste during operation of the Project.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High Managing solid waste is an indirect mitigation measure to protect the quality of resources by preventing non-hazardous waste and putrescible food from reaching the land and waterbodies used by wildlife during operation of the Project.
	HWMP (Section 11.10) This Plan includes measures for classifying, handling, storing, transporting and disposing of hazardous waste materials that could impact fish habitat during construction, operation and closure.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High Reducing the risk of wildlife's exposure to hazardous waste is an important measure to preserve the quality of resources for hunting. To ensure effectiveness of the mitigation measures, the HWMP relies on monitoring to ensure storage, movements and treatment of hazardous waste meet performance objectives and regulatory guidelines. Monitoring will include documentation of each shipment to ensure traceability; inspections of hazardous waste storage areas, landfarm, and oil water separator; among others.
	RMP (Accidents and Malfunctions) (Section 11.12) This Plan includes measures for early detection of major risks, risk reduction, loss control and strategies to minimize the effects on the environment.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High By preventing accidents and malfunctions, negative effects to the quality of resources in the area, including wildlife, will be mitigated. To ensure effectiveness of the measures proposed, the RMP relies on monitoring the risk protection measures incorporated in the engineering design of the Project, fundamentally of the pit wall adjacent to Jacko Lake and of the structural integrity of the TSF. A Quantitative Risk Assessment of dam breach risk is envisaged and additional mitigation measures will be evaluated for inclusion in the next stage of design.
	Natural Hazards Management Plan (Section 11.13) This Plan provides a framework to identify, assess, monitor and manage risks associated with natural hazards, such as terrain stability or floods on Project infrastructure, thus minimizing potential effects to the receiving environment.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High By identifying potential natural hazards and verifying the Project design is adequate to withstand them (e.g., simulation of 1-in-475 year earthquake to determine if it would affect integrity of the facilities), potential negative effects to the quality of traditional resources, including wildlife, will be mitigated. To verify effectiveness of the protection strategy, stability monitoring is a key component. For example, for the Open Pit, the slope stability will be constantly monitored through a combination of Automated Total Station Networks, non-reflective LiDAR scanning, SSR, GPS, and vibrating wire piezometers. The Automated Total Station Networks and SSR will enable real-time monitoring, which can be alarmed to provide immediate indication of possible slope instability and enable appropriate response.
	ERP (Section 11.14) This Plan includes measures to address emergencies, that is, situations that immediately threatens the well-being of the environment and quality of resources, emphasizing containment, notification, and mobilization to deal with the emergency.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and traditional plant habitats and decreasing the quality of harvested resources.	High By implementing the measures and procedures outlined in the ERP, it would be possible to quickly address and contain risks associated with specific emergencies, thus limiting negative effects on the environment.
Use of Traditional/Cultural Areas			
Changes in access to or use of preferred ceremonial or other cultural uses sites	Develop an Access Management Plan in consultation with Aboriginal Groups.	Maintaining access to traditional cultural/ceremonial use sites will allow for the use of cultural/ceremonial areas.	Moderate An access plan developed in consultation with Aboriginal Groups will accommodate access to the area when required for traditional and cultural use of the area.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Develop alternate access road and parking lot to Jacko Lake to maintain the current conditions of free access to the Lake, which facilitates access for cultural/ceremonial use.	Maintaining access to traditional cultural/ceremonial use sites will allow for the use of cultural/ceremonial areas.	High Construction of an alternate road is an effective measure to mitigate the loss of the existing access road in the Project footprint. It will maintain continued access to Jacko Lake for cultural/ceremonial use of the area.
	Develop an alternate parking lot to Jacko Lake to facilitate access to the Jacko Lake area for cultural/ceremonial use.	Maintaining access to traditional cultural/ceremonial use sites will allow for the use of cultural/ceremonial areas.	High Construction of an alternate parking lot is and effective measure to mitigate the loss of the existing parking lot in the Project footprint. It will maintain continued access to Jacko Lake for cultural/ceremonial use of the area.
	Implement appropriate signage indicating blasting times and communicate with Aboriginal Groups regarding when blasting is likely to occur.	Working with Aboriginal Groups will ensure clear lines of communication related to access.	High Informing about blasting times will mitigate disturbances of unexpected noise and vibration to users of the area for ceremonial/traditional purposes.
	Continue to support Aboriginal users' access to lands.	Working with Aboriginal Groups will ensure clear lines of communication related to access.	Moderate Facilitating access to lands will allow to Aboriginal users to undertake ceremonial/traditional use of these areas mitigating the loss of areas used for ceremonial/traditional purposes within the mine footprint.
	KAM will facilitate access to the Project site for the SSN to conduct traditional use activities and conduct offerings, when possible.	Maintaining access to traditional cultural/ceremonial use sites will allow for the use of cultural/ceremonial areas.	Moderate By facilitating access the Project site to conduct traditional use activities and offerings, effects of loss of access will be mitigated. Traditional activities will be able to continue to be undertaken in the Project site although more limited.
	To accommodate the SSN's use of Jacko Lake as an early spring trout fishery, KAM will avoid construction activities within Jacko Lake during spring (Section 6).	Avoidance during key harvesting times will ensure the Aboriginal traditional fishery is maintained.	High In addition to avoiding construction during spring, which will effectively avoid effects on the spring fishery, the Fish Habitat and Fishery Offsetting Plan (Knight Piésold Consulting Ltd., 2016b) will be implemented. The updated Fish Habitat and Fishery Offsetting Plan includes components to support revitalization and continuation of the asserted SSN spring fishery at both the inlet and outlet of Jacko Lake.
	Access to Jacko Lake will be maintained similar to current conditions.	Maintaining access to traditional cultural/ceremonial use sites will allow for the use of cultural/ceremonial areas.	High By developing a new access road, boat launch and shoreline trails, the access to Jacko Lake for fishing will be maintained.
	KAM will also support the SSN in stewardship of water and environmental quality through involvement in ongoing review of existing water quality/quantity programs and plans.	Implementation of Best Achievable Control Technology or management practices will maintain surface water quality and ensure resources are available for harvest.	Moderate to High Supporting a water stewardship program will be an effective way to contribute to the protection of water quality and availability at the regional level. Implementation of the Project's Environmental Management Plans will help mitigate effects on water as a result of the Project and therefore fish and fish habitat.
	SWQMMP (Section 11.23) Description: The focus of the SWQMMP is on minimizing Project effects on surface water quality, regulatory compliance, monitoring the effectiveness of mitigation measures, and verifying the predictions completed as part of the effects assessment of the Project. The primary source of mitigation measures for surface water quality is the Water Management and Hydrometric Monitoring Plan (Section 11.7). The SWQMMP is designed to limit generation of contact water (i.e., water that comes into contact with and may pick up a geochemical load from a Project facility) and to prevent sediment laden runoff from leaving the site.	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats will ensure resources are available for harvest.	Moderate By implementing a combination of measures, effects on surface water quality will be mitigated. To ensure effectiveness of the mitigation measures, the SWQMMP details procedures for monitoring surface water quality and ensure, among others, that parameters listed in the *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CCME, 1999) are met, above which additional monitoring and/or mitigation strategies may be triggered. This guideline presents thresholds values for water parameters such temperature, dissolved oxygen, turbidity, pH, nutrients, metals and organics within a range suitable for maintaining healthy populations of fish and other aquatic organisms. Monitoring will be implemented with a focus on assessing for changes in surface water quality compared to baseline and predicted concentrations, water quality guidelines and site-specific water- quality benchmarks.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	GWQMMP (Section 11.24) Description: The focus of the GWQMMP is on regulatory compliance, monitoring the effectiveness of mitigation measures, and verifying the predictions completed as part of the effects assessment of the Project. The primary source of mitigation measures for groundwater quality is the Water Management and Hydrometric Monitoring Plan (Section 11.7). The GWQMMP is designed to protect groundwater quality from seepage and runoff down-gradient of Project facilities in the Peterson Creek watershed.	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats will ensure resources are available for harvest.	High By implementing a combination of measures, effects on groundwater quality will be mitigated, contributing to maintaining the environmental quality of the site. To ensure effectiveness of the mitigation measures, the Groundwater Flow Model incorporated sensitivity analyses that help to evaluate their effectiveness, as well as other sources of uncertainty in the models. For example, the groundwater flow scenarios show that the majority of seepage pathways from the TSF and MRSFs are to the open pit; however, all scenarios have some seepage pathways that eventually reach the receiving environment in Peterson Creek (ERM, 2016a). The GWQMMP relies on monitoring to verify the mitigation and management measures are adequate, perform as predicted in the effects assessment, and provide information for adaptive management if unanticipated effects on groundwater are discovered. Groundwater quality results will be compared against baseline ranges for each monitoring well, as well as generic water quality guidelines. For most parameters, action triggers will be developed for monitoring results that exceed generic water quality guidelines specific to the downstream users.
	ESCP (Section 11.2) Description: The ESCP has been established to manage mitigation approaches designed to prevent or minimize erosion and contain sediment within the mine site. The environmental protection measures associated with mitigation of erosion and sedimentation focus on: • Incorporation of erosion and sedimentation control into design and planning (e.g., minimize disturbance, progressive reclamation); • Application of erosion control BMPs (e.g., re-contouring stockpiles of soil and overburden to a 2H:1V slope and seeding for erosion control); • Application of sediment and runoff control BMPs (e.g., minimizing the area of exposed soils, timely seeding and planting, and the use of erosion control measures appropriate to the soil erodibility potential in the TSF); and • Monitoring and maintenance (e.g., sediment control and runoff management structure functionality will be maintained by removing sediment captured in traps before it exceeds 15% loss of trap capacity).	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats will ensure resources are available for harvest.	High By implementing a combination of measures, such as erosion control, effects on environmental quality of the site will be mitigated. To ensure effectiveness of the mitigation measures, the ESCP relies on continuous monitoring to verify that the management practices are adapted to local conditions, are properly executed, and, if needed, more detailed site-specific prescriptions are completed. For example, areas affected by erosion will be mapped and information—including erosion type, intensity, the extent of the affected area, site UTM coordinates, and existing control measures and an assessment of their performance—will be documented. Affected sites will be regularly checked for evidence of erosion, particularly after rainfall events, until erosion is not a concern. Monitoring results will be used to trigger an appropriate adaptive management response. The effectiveness of the ESCP will be assessed regularly (at least annually). The reviews will reflect changes in environmental requirements, technology and operational procedures.
	ML/ARD Management and Monitoring Plan (Section 11.5) Description: The purpose of the ML/ARD Management and Monitoring Plan is to formulate a series of operational procedures and closure activities that will avoid the development of acidic drainage from the Project MRSFs, TSF and ore stockpiles and minimize the impact of neutral metal leaching to the receiving environment from these facilities. Management strategies specific to the Project include the following: • Locate mine rock storage facilities to areas east and south of the Open Pit to increase distance from the City of Kamloops and facilitate collection of seepage; • Segregate high-risk versus low-risk rock types in the pit; • Blend PAG and NPAG materials in proportions appropriate to prevent ARD onset; • Construct a NPAG base for the blended MRSFs; • Limit infiltration by the implementation of a cover; • Minimize east MRSF size and construct only of NPAG material to limit seepage over the Peterson Creek Aquifer;	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats will ensure resources are available for harvest.	High By implementing a combination of measures to prevent development of acidic drainage, negative effects on water quality (e.g., changes in pH and concentration of metals) can be mitigated. Effective mitigation is achieved by addressing geochemical, hydrological and geotechnical factors of risks (BC MEM, 1998) through a diversity of measures. For example, blending PAG and NPAG mine rock might be an effective measure to prevent generation of acid drainage when comprehensive material characterization, waste design and construction plans are supported by detailed prediction information (BC MEM, 1998). Similarly, the use of a cover on waste rock piles is an effective measure to reduce water infiltration. The MRSF closure cover reduces infiltration through the mine rock and into the groundwater system. As outlined in Appendix A of Appendix 6.4-C of the Application/EIS, a cover design that incorporates a 0.6 m till layer (0.3 m of which is compacted) between the mine rock and the topsoil is anticipated to reduce annual infiltration from 44 mm to 8 mm. To ensure effectiveness of the mitigations, monitoring will include: in-pit monitoring and sampling (e.g., ore identification and management, segregation of PAG and NPAG mine rock), seepage and tailings slurry water quality monitoring, and commissioned of on-site laboratory.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	• Peterson Creek Diversion constructed to limit the quantity of contact water discharging to Peterson Creek; • In-pit backfill contains seepage and prevents discharge to receiving water streams; and • Use liner systems in the TSF where tailings are in contact with embankments to limit infiltration of tailings pore water.		
	Air Quality Monitoring and Dust Control Plan (Section 11.6) Description: This Plan includes measures to reduce emissions and dust that could deposit on water surfaces. A supplemental submission was developed that provides more detail related to how dust mitigation measures will be implemented. This is documented in *Memorandum: Management of Fugitive Dust* (KAM, 2016a). As outlined in this Plan, KAM will implement both preventative procedures and reactive control measures in order to minimize dust emissions from the Project. Some key examples include: • Daily visual inspections of the TSF and active haul roads; • Application of water to the tailings beach and haul roads; • Application of dust suppressants on the TSF tailings beach and haul roads; • Application of surfactants to the haul roads; • Rotation of tailing spigot points; and • Use of polymers in the tailings thickening process and direct application to the tailings beach, when required	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats will ensure resources are available for harvest.	<u>High</u> By implementing a combination of measures, including dust control, effects on environmental quality of the site will be mitigated. To ensure effectiveness of the mitigation measures, the Air Quality Monitoring and Dust Control Plan relies on continuous monitoring. It can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system. Monitoring will identify changes in air quality in relation to guidelines and standards established by Canadian and BC applicable regulatory criteria.
	Water Management and Hydrometric Monitoring Plan (Section 11.7) Description: The water quality model of the Project was updated during the first round of IRs. The site water quality predictions in the TSF and water management ponds changed as a result of modifications to the water balance model, baseline inputs and geochemistry source terms for the mine source materials. The updated results of the assessment and water quality mitigation measures are detailed in the document *KGHM Ajax Mining Inc. Ajax Project: Water Quality Prediction Updates and Information Request Responses* (Knight Piésold Consulting Ltd., 2016a). Some key examples of mitigation measures in the mine site Water Management and Hydrometric Monitoring Plan include: • SMRSF Pond: manage seepage and runoff from the southern extent of the SMRSF; • Reclamation of SMRSF in Decommissioning and Closure with a low permeability till layer overlain with topsoil to reduce infiltration and maximize evapotranspiration and runoff; • Dry cover on TSF to reduce infiltration into the underlying tailings solids and increase non-contact runoff; • Peterson Creek Downstream Pond: interception of seepage from the SMRSF and West MRSF with associated water management ponds, reclaimed to mill for Operation Phase water demand; and • Mitigation measures for flow reductions in Peterson Creek will be implemented to ensure that existing water license requirements are met. Eight potential mitigation options have been identified and outlined in *Memorandum: Peterson Creek – Potential Streamflow Mitigation*	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats will ensure resources are available for harvest.	<u>High</u> By implementing a combination of measures, effects on water flow will be mitigated, contributing to maintaining fish availability. To ensure effectiveness of the mitigation measures for water flow, site monitoring and a follow-up program will be implemented to evaluate and document if the Water Management and Hydrometric Monitoring Plan is successfully avoiding and minimizing potential adverse effects to the environment. If adverse findings are evident from the monitoring of a particular area or process, adaptive management policies will be implemented. All monitoring components will be evaluated regularly to assess if changes to the schedule, frequency or component continue to be required or adaptively changed.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	Strategies (BGC Engineering Inc., 2016). Individually, or in combination, these options could be implemented to minimize or completely offset Project-related effects, and could also potentially benefit fish habitat in Lower Peterson Creek.		
	Explosives Management Plan (Section 11.11) Description: This Plan includes measures to minimize effects on water and aquatic life related to transportation, on-site manufacturing, storage and use of explosives. For example, one measure is to limit the potential for the introduction of nitrogenous nutrients from explosives to water. In relation to the location of the explosive facilities, *Memorandum: Location of the explosives facility* (KAM, 2016b) states that the alternate location for the explosives manufacturing and storage as presented in the Application/EIS would now be the confirmed location for this facility. The selected location is situated 4.5 km northwest of the pit.	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats will ensure resources are available for harvest.	High The Explosives Management Plan will include detailed plans of the explosives facility, specifications for the maintenance of an inventory system, etc., to ensure proper management of explosives. To verify effectiveness of measures included in the Plan, monitoring includes regular inspections of storage facilities for leaks or non-compliance with policies and procedures.
	Soil Salvage and Handling Plan (Section 11.3) This Plan includes measures and procedures for adequate soil handling as well as erosion control on stockpiles, limiting transport of soil to the aquatic environment. The Soil Salvage and Handling Plan provides the procedures for soil stripping and quality control of soil salvaging.	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats will ensure resources are available for harvest.	High By implementing BMPs while salvaging soil (e.g., avoiding soil salvaging during adverse weather, protecting soil stockpiles against erosion), the potential for erosion and transport of soil to the aquatic environment can be effectively mitigated, thus indirectly protecting fish habitat and availability of fish. To achieve effective mitigation, soil stripping management and erosion will be monitored, as will soil contamination (e.g., potential contaminant accumulation and metal deposition / mobility patterns). Soil quality should be maintained within *Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health* (CCME, 2013) and Soil Criteria for Toxicity to Soil Invertebrates and Plants listed in the *Contaminated Sites Regulation*, included in BC's *Environmental Management Act*.
	Dark Sky Management and Monitoring Plan (Section 11.19) This Plan included measures to eliminate spill light and glare and limit sky glow, which can affect behaviour of wildlife, including fish surrounding the Project. Protection measures will include illumination management (e.g., setting timers, placing motion sensors), shielding and direct lighting (e.g., directing light and/or shielding light to target areas), and spectral control (e.g., use of 500 nm filtered LED fixtures).	Implementation of Best Achievable Control Technology or management practices to maintain artificial light levels within threshold and maintain habitats to ensure resources are available for harvest.	High The Dark Sky Management and Monitoring Plan includes measures for spectral control that are effective for limiting the effect of spill light. Native flora and fauna are often sensitive and responsive to light in the short wavelength range (less than 500 nm), where ultraviolet light plays an important role for navigation, foraging and mate selection (Bruce-White & Shardlow, 2011). The use of 500 nm filtered LED fixtures will make it possible to control the colour of the light and limit the effect of spill light at the local scale and the effect of sky glow at the regional scale. Sky darkness will be monitored at least twice a year and compared to baseline conditions to determine changes resulting from Project illumination. If changes in sky darkness are observed, then adaptive management lighting options will be assessed based on magnitude and duration of the activities as well as in response to concerns raised by local residents.
	Implement the Fisheries and Aquatic Life Monitoring Plan and the SWQMMP to assess predicted flow changes against actual flow changes. Flow and hydraulic characteristics at the established transect sites will be monitored during the Project Construction, Operation, Decommissioning and Closure, and Post-Closure phases to assess whether the predicted changes in flow meet the recommended flow threshold for BC streams. Should monthly values be measurably different than predicted values, additional mitigation measures will be considered, which could include working with the provincial government to manage releases from the Peterson Creek Downstream Pond to meet instream flow needs.	Implementation of Best Achievable Control Technology or management practices to maintain surface water quality and maintain habitats will ensure resources are available for harvest.	Moderate The Peterson Creek Diversion System will be designed to preserve flows to existing fish habitat and Aboriginal fishing area downstream of Jacko Lake Dam (JLD1) for a minimum of 100 m in Peterson Creek. The design further aims to maintain current (pre-mining) flow conditions and allow fish passage as much as practicable. The system will be designed with a low level decant pipe discharge system with a flow capacity in the range of 38 – 71 l/s, as required by the water bailiff according to the requirements for downstream water users (BGC Engineering Inc., 2015). The low level decant is required during dry periods resulting in lake levels below the spillway/outlet crest elevation. There will be no release from Jacko Lake when the water level falls below the inlet of the decant pipe. Additional hydraulic data and habitat modelling analyses are being undertaken to assess potential impact to fish habitat during October to March (Norwest Corporation, 2016). The development of a streamflow mitigation plan that is acceptable to regulators and stakeholders is expected to be an iterative process (BGC Engineering Inc., 2016).
	Implement No Fishing, Firearms, Hunting and Plant Gathering policies.	A no fishing, firearms, hunting and plant gathering policy for workers and contractors will reduce the potential for	High By implementing these policies, the pressure to traditionally harvested resources by workers and contractors will be mitigated. The policies will be enforced and those who do

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
		increased pressure on traditionally harvested resources and maintain availability of fish, wildlife and plant populations for harvesting.	not comply will be removed from the Project. For example, in the case of fishing, this measure will mitigate the potential increase in fishing pressure from introduction of the workforce, representing potentially 17 anglers during the Construction Phase and 10 anglers during the Operation Phase.
Change in the experience of using land and resources (sensory disturbances)	Design the Project to minimize noise and vibration effects (see Section 14.2.2.8), including increasing buffer distance, optimizing equipment usage, and using enclosures for noise emissions.	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High By implementing a combination of measures to reduce noise and vibration generated by the Project, noise and vibration levels will be maintained within target thresholds and will not prevent users of the area to undertake ceremonial/traditional activities. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded.
	Implement BMPs during all Project phases to reduce noise emissions (e.g., best practices for vehicle and equipment handling, selecting best achievable technology, providing training for operators, implementing planning and engineering controls, etc.).	Implementation of Best Achievable Control Technology or management practices will decrease the effects of noise on those practicing traditional uses of the lands.	High By implementing a combination of measures to reduce noise generated by the Project, noise levels will be maintained within target thresholds and will not prevent users of the area to undertake ceremonial/traditional activities. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded.
	To reduce visual disturbances, progressively revegetate Project components and other disturbed areas on an ongoing basis during the Construction and Operation phases, with larger Project components further revegetated at Closure (Section 8.4).	This measure will provide for the rapid re-vegetation of all temporarily disturbed areas and will minimize visual effects for Project components that may be visible to those practicing traditional uses of the lands.	Moderate Revegetation of disturbed areas is an effective way to enhance the aesthetics and natural aspect of the area. The effectiveness of this measure increases as vegetation establishes in more areas overtime, through progressive revegetation. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good.
	Employ good visual design principles.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	High Designing elements of the Project to mimic as much as possible the natural landforms, relieve and vegetation of the area is an effective way to reduce the visual contrast caused by Project disturbances in the landscape.
	Infrastructure aesthetics will consider use of non-reflective materials in the construction of buildings and other infrastructure.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	Low This measure will contribute to reducing the visual contrast of the Project with the surrounding environment.
	Infrastructure will be painted with natural colours that blend into the landscape or will be screened with tall shrubs or trees.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	Low This measure will contribute to reducing the visual contrast of the Project with the surrounding environment.
	During Post-Closure, monitor the re-vegetation of the large Project components to ensure that the vegetation is taking hold and growing in a manner sufficient to mimic the surrounding landscape. It is anticipated that Aboriginal Groups will be engaged in these monitoring activities.	Implementation of Best Achievable Control Technology or management practices will decrease visual effects on those practicing traditional uses of the lands.	Moderate Revegetation of disturbed areas is an effective way to enhance the aesthetics and natural aspect of the area. The effectiveness of this measure increases as vegetation establishes in more areas overtime, through progressive revegetation. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
			planting is considered good short-term success. After 5 years, a 75% survival is considered good.
	Implement the following management and monitoring plans: Air Quality Monitoring and Dust Control Plan, Dark Sky Management and Monitoring Plan, Noise and Vibration Management Plan, and Landscape Design and Restoration Plan (Chapter 11).	Implementation of Best Achievable Control Technology or management practices will decrease effects on those practicing traditional uses of the lands.	<u>High</u> Implementation of these plans will mitigate effects on sensory disturbances (e.g., change of the experience of using the area because of increased dust, artificial light, noise or reduced visual aesthetics). Each plan includes many different mitigation measures that act in combination. For example, by implementing a combination of mitigation measures, it can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system. To reduce noise generated by the Project, a combination of measures will maintain noise and vibration levels within target thresholds and will not prevent users of the area to undertake traditional activities. Noise and vibration will be monitored to ensure performance objectives are achieved and thresholds for the protection of human health are not exceeded. The Dark Sky Management and Monitoring Plan includes measures for spectral control which are effective to for limiting the effect of spill light. The use of 500 nm filtered LED fixtures will make it possible to control the colour of the light and limit the effect of spill light at the local scale and the effect of sky glow at the regional scale. Sky darkness will be monitored at least twice a year and compared to baseline conditions to determine changes resulting from Project illumination. If changes in sky darkness are observed, then adaptive management lighting options will be assessed based on magnitude and duration of the activities as well as in response to concerns raised by local residents. Incorporating the end land uses into the Project design is an effective way to direct the implementation of mitigation measures towards achieving the end land uses. For example, selecting and planting species that will enhance wildlife habitat for hunting or for plant gathering around Jacko Lake, etc.
Changes in the quality of the harvested resources	Implement Project design components and Project operation components to reduce dust from crushers, conveyors, stockpiles and road surfaces.	Implementation of Best Achievable Control Technology or management practices will minimize contaminants entering the environment and wildlife habitats and decreasing the quality of harvested resources.	<u>High</u> By implementing a combination of mitigation measures, it can be expected to regularly and consistently achieve 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
	Transportation Management Plan (Section 11.20). The following measures to manage traffic and minimize environmental impact are included in this Plan: industry-recognized design criteria and construction management practices for access improvement works; commuting trip demand reduction through car or vanpooling, bus staging, and staggering of shifts; heavy vehicle routing, including implementation of two-way radio communication and control processes to manage traffic movement as required; on- and off-site parking management for commuting staff; and spill containment and sediment control practices. Supporting actions include: employment contract incentives for participation in initiatives to reduce travel demand; workplace travel planning; and community information, reporting, and feedback programs.	Traffic management practices will reduce wildlife vehicle collisions, maintain wildlife habitats and ensure resources are available for harvest.	<u>High</u> By minimizing traffic, air contaminants and fugitive dust generated by vehicles will be mitigated, therefore protecting indirectly the quality of resources harvested. This measure, in combination with others, will contribute to regularly and consistently achieving 90% effectiveness on dust control. Scenarios of lower effectiveness (e.g., 70% or 80%) would be infrequent and short-duration episodes, especially when tracked through an effective monitoring and adaptive management system.
Changes to availability of cultural/ceremonial sites	KAM will provide continued support to the SSN to participate in accessing and/or documenting resources of cultural value prior to the Project footprint disturbance.	Working with Aboriginal Groups will ensure clear lines of communication related to availability of cultural/ceremonial sites and uses.	<u>Moderate</u> Accessing and documenting the area prior to footprint disturbance will mitigate the effects of its physical loss on site, while helping to preserve and transmit its cultural value. This measure is expected to be effective, because the SSN will be directly involved in planning and implementation.

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	KAM will work with the SSN to establish a funding program that would provide SSN with financial support for cultural heritage projects that they deem important.	Working with Aboriginal Groups will ensure clear lines of communication related to availability of cultural/ceremonial sites and uses.	Moderate Funding availability will facilitate the creation of heritage educational or other relevant cultural programming for the SSN. These measures are expected to be effective because the SSN will be directly involved in the planning and implementation. Funding availability has been useful at helping preserve Aboriginal culture. An example of program of this nature is the Weyt-k Secwepemc First Words, funded by the First People's Cultural Council, aiming at preserving Aboriginal language.
	KAM proposes mitigation that includes further investigation of the archaeological sites that will be directly impacted by development. This mitigation will focus on determining the antiquity and function of the site, understanding the cultural values associated with the site, and how these could be related to possible mitigation options. A final mitigation strategy for the archaeological resource will be determined through discussion between KAM, SSN and the Archaeology Branch.	Working with Aboriginal Groups will ensure clear lines of communication related to availability of cultural/ceremonial sites and uses.	Moderate Further investigation of archaeological sites will mitigate the effects of their physical loss on site, while maintaining their function to preserve and transmit cultural and traditional knowledge and value. This measure is expected to be effective because the SSN will be directly involved in the planning and implementation, together with the Archeology Branch and KAM.
	KAM will continue to engage the SSN in identifying mitigation for ceremonial practices with respect to the Hunting Blind Complex. This may include but is not limited to relocating features of the Hunting Blind Complex to a suitable location identified by the SSN, documenting the Hunting Blind Complex using 3D imagery, preparing a documentary or scaled 3D model of the Hunting Blind Complex for educational purposes, and funding for heritage education or other relevant programming.	Working with Aboriginal Groups will ensure clear lines of communication related to availability of cultural/ceremonial sites and uses.	Low Though relocating and documenting features of the Hunting Blind Complex will mitigate the effects of their physical loss on site while maintaining their function to preserve and transmit traditional knowledge, the site will no longer be available. Funding availability will facilitate the creation of heritage educational or other relevant cultural programming for the SSN. These measures are expected to be effective, because the SSN will be directly involved in the planning and implementation. Funding availability has been useful at helping preserve Aboriginal culture. An example of program of this nature is the Weyt-k Secwepemc First Words, funded by the First People's Cultural Council, aiming at preserving Aboriginal language.
	Implement a compensation and offsetting plan that proposes to create fish availability and habitat. To accommodate SSN's concerns about effects to Jacko Lake fishery, KAM proposes to work with SSN to identify other potential candidate options for habitat compensation and offsetting options within the traditional territory (Knight Piésold Consulting Ltd., 2016b).	Development of the Project would result in the permanent loss of fish habitat and associated productive capacity; therefore, offsetting options are required. Offsetting is required when residual, serious harm to fish remains after avoidance and implementation of mitigation measures.	High Based on the updated Fish Habitat and Fishery Offsetting Plan, net losses due to the Project are calculated to be 51,051 habitat units in total, which are proposed to be offset by 67,151 habitat units. The net increase in surface area and storage volume in Jacko Lake, combined with proposed enhancements to Upper Peterson Creek, will at minimum maintain and potentially increase productive capacity and rearing habitat for rainbow trout in Jacko Lake.
Changes to availability of cultural/ceremonial species of importance	To mitigate against potential chickadee habitat loss, specific mine footprints were redesigned during Project planning to ensure the minimum possible impact on the surrounding environment would occur. Habitat loss will be mitigated during construction by keeping Project footprints to the minimum size required. At the end of mine life, habitat will be restored through reclamation and revegetation processes during the Decommissioning and Closure stages.	Redesign of the Project footprints will minimize effects to habitat.	Moderate By implementing grassland and open forest restoration, and encouraging land acquisition, effects on chickadee habitat losses will be mitigated. A total of 2,093 hectares (ha) have been identified as potentially suitable for restoration. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good. Grass cover of 65% is considered suitable for restoration of sharp-tailed grouse habitat.
	Additional mitigative strategies include providing support to the SSN to participate in accessing areas and/or documenting resources of cultural value prior to the Project footprint disturbance.	Working with Aboriginal Groups will ensure clear lines of communication related to cultural heritage programming.	Moderate Accessing and documenting the area prior to footprint disturbance will mitigate the effects of its physical loss on site while helping to preserve and transmit its cultural value. This measure is expected to be effective, because the SSN will be directly involved in the planning and implementation.
Change in the availability of harvested resources	Impact avoidance and reduction mitigation proposed for the Project are described in detail in the Wildlife and Vegetation Monitoring Plan (Section 11.27) and include avoiding rare plant occurrences, minimizing	Avoidance of sensitive plant occurrences will ensure that habitat and, therefore, rare and traditional use plant populations are available for harvesting.	High Avoidance of alteration or change to an area is the most effective measure to prevent negative effects to its components. By re-designing the mine footprints, the loss of plants and wildlife in Cherry Creek and Inks Lake was avoided, thereby preserving the areas for

Factor	Mitigation Measure	Rationale for Inclusion	Effectiveness of Mitigation
	road and transmission line water crossings, erosion prevention and bank stabilization techniques.		traditional harvesting. By reducing the number of road and transmission line water crossings, impacts to fish, plants and wildlife habitat are minimized, and therefore maintaining the availability of these resources.
	Mitigation through habitat rehabilitation will be implemented during the Decommissioning and Closure phase, and once closure objectives are achieved, access to the mine site will be restored similar to current conditions, with the exception of the open pit area where access will not be restored.	Implementation of Best Achievable Control Technology or management practices will reduce habitat losses and maintain traditional plant availability.	Moderate Rehabilitation of disturbed areas is an effective way to re-establish availability of resources for harvesting. The effectiveness of this measure increases as vegetation establishes in more areas overtime, through progressive revegetation. Revegetation has been successfully applied in numerous mine sites in Canada and around the world. When proper planning and testing is conducted and post-closure care and maintenance is applied, habitats develop to meet specified targets. The criteria to determine revegetation effectiveness will be strongly dependent on the agreed revegetation goal. Often, the goal is a diverse plant community of native species including grasses, forbs, shrubs and trees. For example, for woody species (trees and shrubs), a survival rate of at least 80% a year after planting is considered good short-term success. After 5 years, a 75% survival is considered good.
	KAM will provide support to the SSN to participate in accessing, harvesting, and/or documenting plants of cultural value prior to the Project footprint disturbance.	Collection of additional and up-to-date data will ensure sensitive plants are protected to the greatest degree possible.	High By facilitating access to harvest and document plants of cultural value prior to Project footprint disturbance, plants on site will be available to be harvested and knowledge about their habitat will be documented for use in reclamation planning and implementation.
	For confirmed rare plant occurrences that cannot be avoided, transplantation of these rare plants will be considered based upon guiding principles outlined in BMP: Guidelines for Translocation of Plant Species at Risk in British Columbia. KAM will support regional rare plant surveys and research with SSN to determine the distribution of these rare plant species throughout the RSA (Section 6.8).	Implement Best Achievable Control Technology or management practices according to BMPs described in Provincial protocols: *Guidelines for Translocation of Plant Species at Risk in British Columbia*.	Moderate Transplanting rare plants from areas to be disturbed will mitigate their mortality and keep their availability elsewhere. However, effectiveness of the mitigation will depend upon survival of transplanted plants. A broad range of survival rates ca be expected (10-90%) depending on target species and correct implementation of transplanting technique.
	KAM will work with the SSN to establish a funding program that would provide the SSN with financial support for cultural heritage projects that they deem important.	Working with Aboriginal Groups will ensure clear lines of communication related to availability of cultural/ ceremonial sites and uses.	Moderate Funding availability will facilitate the creation of heritage educational or other relevant cultural programming for the SSN. These measures are expected to be effective, because the SSN will be directly involved in the planning and implementation. Funding availability has been useful at helping preserve Aboriginal culture. An example of program of this nature is the Weyt-k Secwepemc First Words, funded by the First People's Cultural Council, aiming at preserving Aboriginal language.
	KAM continues to engage the SSN in developing reclamation plans, including revegetation plans.	Working with Aboriginal Groups will ensure clear lines of communication related to monitoring and follow-up plans.	Moderate The SSN's involvement in the planning and development of reclamation and revegetation plans will be effective at ensuring that end land uses and plant species of interest to the SSN are re-established in the reclaimed areas.

Table 2: Hierarchy Used for Effectiveness Criteria

	Effectiveness Criteria
High	Built into Project design. Uses well established industry standard design/equipment, etc. Clear responsibility/oversight by qualified professional.
Moderate	Secondary level or in-direct measure. Potential challenges implementing or enforcing. Additional detail required to more clearly define this measure to increase confidence.
Low	Non-standard measure. Beneficial if successful; however, further research is required to develop details and increase confidence in this measure.

4.0 CONCLUSION

We trust that the information provided in this memorandum addresses the question or concern noted in Section 2.

Respectfully submitted,

Amec Foster Wheeler Environment & Infrastructure,
a division of Amec Foster Wheeler Americas Limited

Anayansi Cohen-Fernández, Ph.D., R.P.Bio.
Senior Environmental and Land Reclamation Specialist

Alvaro Paredes, B.Sc., DESS, M.Phil., E.P.
Senior Associate
Environmental Assessment Group Lead

5.0 REFERENCES

Acts and Regulations

Contaminated Sites Regulation, BC Reg 375/96

Environmental Management Act, SBC 2003, c. 53

Reports and Websites

Ackerman, N.K. (2005). *Fish Salvage from the Tieton Dam Stilling Basin, Tieton River, Washington*. Prepared for Tieton Hydropower, LLC., 30 November 2005.

BGC Engineering Inc. (2015). *Water Management and Hydrometric Monitoring Plan*. Appendix 6.4-D of the Application/EIS.

BGC Engineering Inc. (2016). *Memorandum: Peterson Creek – Potential Streamflow Mitigation Strategies*. From BGC Engineering Inc. to KAM, 29 June 2016.

British Columbia Ministry of Energy and Mines (BC MEM). (1998). *Guidelines for Metal Leaching and Acid Rock Drainage at Minesites in British Columbia*. Prepared by W.A. Price and J. C. Carrington. August 1998. Retrieved from http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/mineral-exploration-mining/documents/permitting/ml-ard_guidelines.pdf. Accessed Dec 4, 2016.

Bruce-White, C., & Shardlow, M. (2011). *A Review of the Impact of Artificial Light on Invertebrates.* Buglife – The Invertebrate Conservation Trust, ISBN 978-1-904878-99-5.

Canadian Council of Ministers of the Environment (CCME). (1999). *Canadian Water Quality Guidelines for the Protection of Aquatic Life*.

CCME. (2013). *Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health*.

ERM Group, Inc. (ERM). (2016a). *Memorandum: Effectiveness of Mitigation Measures*. From ERM to Environment and Climate Change Canada. 27 June 27 2016.

ERM. (2016b). *Memorandum: Ajax Project – Summary of Round 1 Technical Working Group Comments and Responses – Fish Habitat and Fishery Offsetting Plan*. From ERM to KAM, 27 July 2016.

ERM. (2016c). *Memorandum: Ajax Project – Summary of Round 1 Technical Working Group Comments and Responses – Terrestrial/Wildlife Mitigation*. From ERM to KAM, 27 July 2016.

Fisheries and Oceans Canada (DFO). (2013). *Measures to Avoid Causing Harm to Fish and Fish Habitat* [webpage]. Retrieved from http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html. Accessed December 2, 2016.

Government of Canada. (1991). *The Federal Policy on Wetland Conservation*.

Kamloops Interagency Management Committee. (1995). *Kamloops Land and Resource Management Plan*. July 1995.

KGHM Ajax Mining Inc. (KAM). (2016a). *Memorandum: Management of Fugitive Dust*. From KAM to KAM Ajax Working Group Members, 22 April 2016.

KAM. (2016b). *Memorandum: Location of the explosives facility*. From KAM to SSN Review Panel, 25 October 2016.

Knight Piésold Consulting Ltd. (2016a). *KGHM Ajax Mining Inc. Ajax Project: Water Quality Prediction Updates and Information Request Responses*. Revision 0, 28 June 2016.

Knight Piésold Consulting Ltd. (2016b). *KGHM Ajax Mining Inc. Ajax Project: Conceptual Fish Habitat and Fishery Offsetting Plan*. Revision 0, 10 July 2016.

Norwest Corporation. (2016). *Memorandum: Peterson Creek Diversion System Alternatives Assessment*. Revision 2. From Norwest Corporation to Michal Wypych, 21 June 2016.

RISC. (2007). *Inventory Methods for Medium-Sized Territorial Carnivores: Badger. Version 1.0*. Standards for Components of British Columbia's Biodiversity No. 25a. Resources Information Standards Committee. BC Ministry of Environment, Ecosystems Branch: Victoria, BC. Available at: http://archive.ilmb.gov.bc.ca/risc/pubs/tebiodiv/.

Wright, D.G., & Hopky, G.E. (1998). *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters*. Department of Fisheries and Oceans. Canadian Technical Report of Fisheries and Aquatic Sciences 2107. Retrieved from http://publications.gc.ca/collections/Collection/Fs97-6-2107E.pdf