

# Summary Assessment Report for the Kemess Underground Project

With respect to the Application by AuRico Metals Inc.  
for an Environmental Assessment Certificate  
pursuant to the *Environmental Assessment Act*, S.B.C. 2002, c.43  
and the *Canadian Environmental Assessment Act*, 2012, S.C. 2012 c. 19,  
as a substituted Environmental Assessment

Prepared by:  
Environmental Assessment Office  
February 16, 2017



## 1. Introduction

This Summary Assessment Report provides an overview of the Environmental Assessment (EA) of the proposed Kemess Underground (KUG) Project as conducted by the Environmental Assessment Office (EAO). The Summary Assessment Report is prepared as an overview of the Assessment Report that meets the requirements of the *Environmental Assessment Act* (Act) and *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and discusses the key findings and conclusions of the EA. The Summary Assessment Report makes direct reference to chapters of the Assessment Report, where more in-depth analysis and discussion can be found.

On April 8, 2014 the former federal Minister of the Environment approved the EAO's substitution request for the KUG Project. Substitution means that, for projects that require an EA under CEAA 2012 and the Act, the EA process of British Columbia (BC) will be substituted for the federal EA process. The substitution approval was granted in consideration of the approach set out in the Memorandum of Understanding between the Canadian Environmental Assessment Agency (the Agency) and the EAO on the Substitution of Environmental Assessments (2013)(the MOU). In accordance with the MOU, the KUG Project underwent one EA, with the Agency providing advice to the EAO throughout the EA in relation to fulfilling the requirements of CEAA 2012. For purposes of meeting the CEAA 2012 substitution requirements, the EAO specifically considered effects that the KUG Project may have in relation to environmental effects described in section 5(1) and 5(2) of CEAA 2012, as well as the *Species at Risk Act* (SARA) section 79 (2). The Assessment Report for the substituted project will inform separate provincial and federal decisions.

Additional detail on the federal requirements can be found in section 9 of this Report, and reporting on the assessment of federal requirements is in section 10 of the Assessment Report.

## 2. Project Description

AuRico Metals Inc. (AuRico) is proposing to construct and operate an underground copper-gold mine with an average production of approximately 24,650 tonnes of ore per day (tpd) over a 13-year period. The KUG Project is located approximately 250 kilometres (km) north of Smithers, and 430 km northwest of Prince George in the Peace River Regional District (Figure 1). The KUG Project deposit is approximately 6 km north of the existing infrastructure from the past-producing Kemess South mine (KS) that operated from 1998-2011. The KUG Project is a modification of KS.

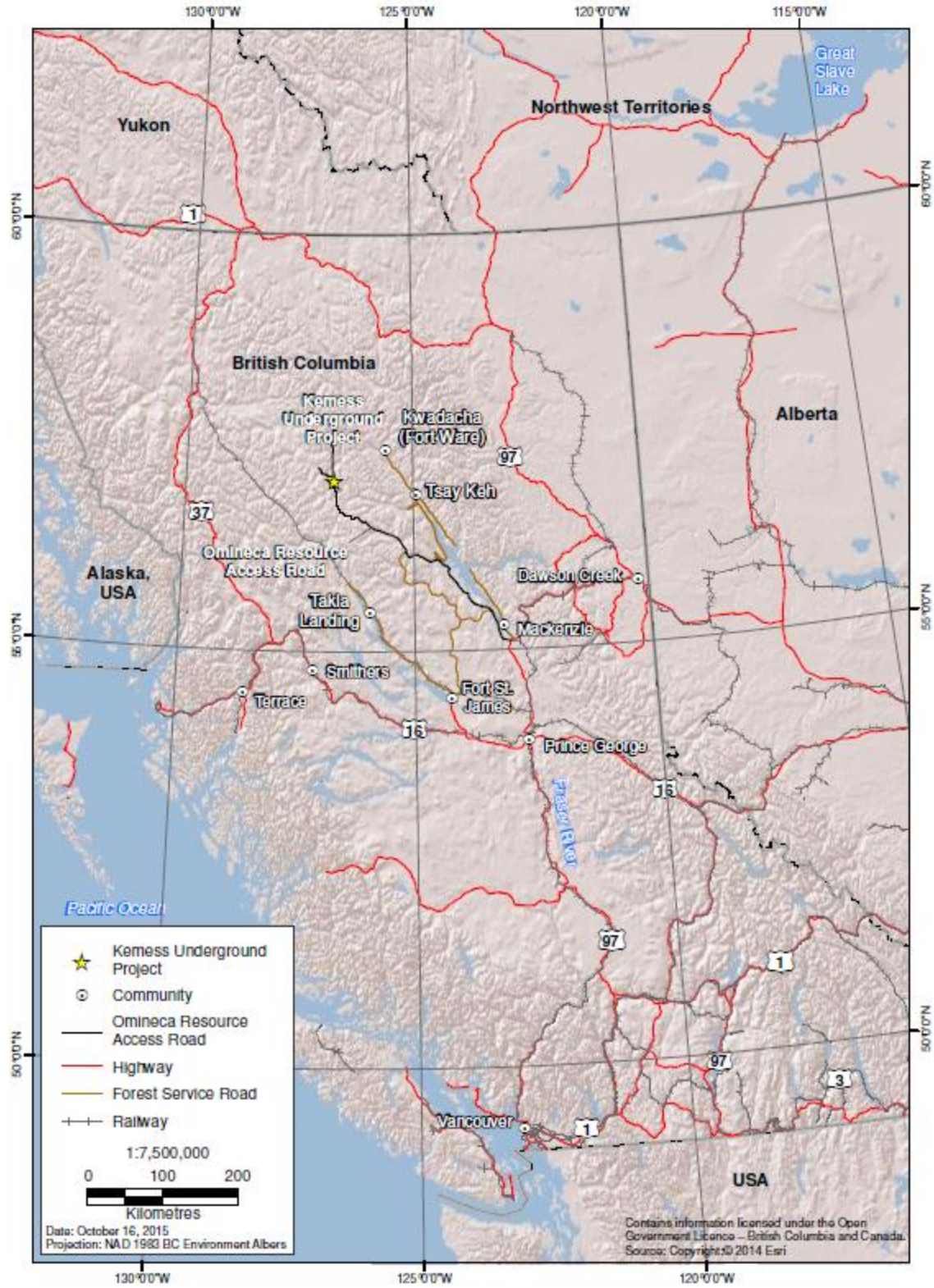


Figure 1. KUG Project location

The KUG Project would use a combination of new and existing infrastructure and improvements from KS for the mine life. It would use the following infrastructure from the KS project: process plant, KS open pit (which would serve as the tailings and waste rock storage facility for the KUG Project), electrical supply network, water management ponds, pumps and water lines, onsite access roads and onsite administrative/service/accommodation facilities (see Figure 2). The KUG Project would also use the existing transmission line, airstrip and road access to the site via the Omineca Resource Access Road (ORAR).

The KUG Project includes the following new proposed infrastructure and activities:

- Underground infrastructure (decline tunnels, panel cave gallery, crushers, ventilation system and exhaust raise, underground conveyor, electrical network including substation, explosives magazines, water sumps and pumps, garages, warehouse, refuge and storage areas);
- Underground activities (blasting, undercutting, ore extraction, crushing and transport and operational dewatering);
- Surface portal infrastructure and activities (construction office, stockpiles, construction laydown areas, fuel storage, electrical distribution and water handling infrastructure);
- Surface infrastructure including a concrete-shotcrete batch plant;
- Surface infrastructure and activities connecting the underground and KS areas (ventilation access road, access corridor including an access road and a tunnel from the triple decline portal area to the KS mill stockpiles, and power line); and
- Tailings storage facility (TSF; KUG Project TSF).

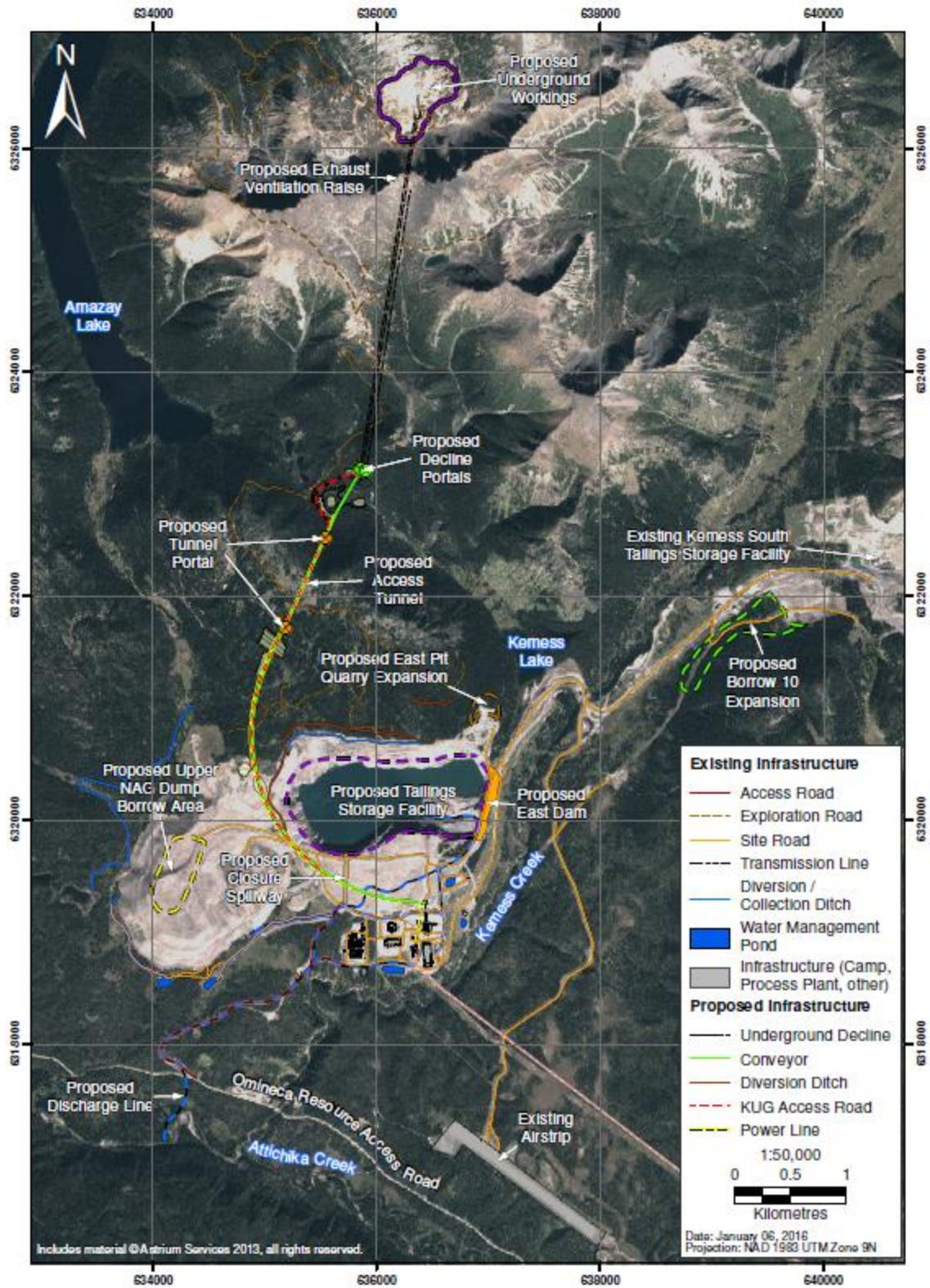


Figure 2: General Project Arrangement

The ore would be processed using the existing KS processing facility. The KUG Project would use the KS pit as a TSF to store the approximately 107 million tonnes (Mt) of tailings and 3 Mt of potentially acid generating waste rock predicted by AuRico. A 25-metre (m) high dam would be built to accommodate the predicted waste products in the KUG Project TSF. Concentrate would be transported by truck along the ORAR to MacKenzie, after which point it would be transported by rail using the existing rail network.

Provided an Environmental Assessment Certificate (EAC) is issued, and once AuRico receives the additional necessary permits and approvals, AuRico plans to commence construction of the KUG Project in early 2018. The operations stage would begin in early 2022, and would end in approximately 2034.

All components and activities within the scope of the EA for the KUG Project (as defined by the Section 11 Order and revised through the Section 13 Orders for the KUG Project) are within the traditional territories of Takla Lake First Nation (TLFN) and Tsay Keh Dene Nation (TKD), and immediately upstream of Kwadacha Nation (KwN) territory. TLFN, TKDN and KwN have a common Sekani heritage and have formed an alliance called the Tse Key Nay (TKN). The KUG Project is adjacent to and upstream of the traditional territory of Gitxsan wilp Nii Kyap and is within the Treaty 8 Disputed Area (the area of disagreement concerning the western boundary of Treaty 8 between the Federal and Provincial governments). The Métis Nation British Columbia (MNBC) do not claim a traditional territory, rather they assert rights and traditional uses throughout BC. The MNBC indicated that historic, current and potential future resource harvesting and cultural activities occur in a “buffer zone,” which is within 200 km of the KUG Project. The EAO notified MNBC of key milestones during the EA to meet federal consultation agreements consistent with the MOU.

### **Project Design as a result of the Environmental Assessment**

AuRico used the EA outcomes from Kemess North (KN) and consultation leading up to the KUG Project EA to identify design changes in response to environmental constraints present in the KUG Project area, First Nations concerns, and potential environmental effects.

Design changes undertaken leading up to the EA include:

- Developing the KUG Project as an underground mine to:
  - Minimize production of waste rock, including potentially acid generating waste rock;
  - Substantially reduce the amount of new surface disturbance; and

- Manage safety issues in an area of high avalanche risk;
- Eliminating the need to use Amazay Lake, which has high cultural and historical importance to TKN, by using the KS open pit for subaqueous waste rock and tailings storage (KUG Project TSF);
- Selecting the decline portal location in consultation with TKN, to avoid development within the Amazay Lake watershed and avoid construction of the connecting surface route proximal to and/or crossing Kemess Creek; and
- Tunnelling through the ridgeline between the KS mine site and the underground portal area rather than constructing a proposed road corridor along Upper El Condor Creek and Kemess Lake to minimize landslide, avalanche and weather risks.

Design changes undertaken during the EA include:

- Removing proposed surface explosives magazines from the portal area due to potential landslide and avalanche risks and using existing explosives magazines near the KS mine site; and
- Selecting water management, treatment, discharge rates and location for discharge of water from the KUG Project TSF based on comprehensive engagement with the TKN First Nations as well as extensive water quality and water balance modelling, and receiving environment water quality and quantity considerations.

An important project design question in the EA was the question of the appropriate water body to receive the water discharged from the KUG Project TSF during construction and operations. During the EA AuRico considered proposing Finlay River or Thutade Lake as a discharge location, instead of the originally proposed Attichika Creek, in consideration of operational and environmental factors. Based on a detailed alternatives assessment conducted with TKN, AuRico ultimately decided to not change the discharge location, as Attichika Creek was the preferred option of TKN.

### **3. Strategic Context**

#### Evolution of the Kemess Property

In the years leading up to depletion of the KS deposit, the mineral lease holder of the Kemess property at the time, Northgate Minerals Corporation, made plans to extend operations by developing the KN deposit. The proposed extension included development of a new open pit, a new tailings and waste rock storage facility in Amazay

Lake and modification of the existing processing plant and related infrastructure. The proposed KN Project underwent a federal and provincial EA by panel review in 2007. The panel indicated that there would be significant adverse environmental, social and cultural effects that outweighed the economic and social benefits and recommended that KN not be approved as proposed. Both the federal and provincial governments accepted the recommendations of the panel, and invited Northgate Minerals to submit an alternate project design for development of the deposit. The proposed development of the KUG deposit by means of an underground mine with limited area of new surface disturbance addresses the concerns raised during the KN panel review. One of the key issues raised in the KN panel process was the impact of KN on Amazay Lake, and the protection of Amazay Lake is a key feature to the re-design from KN to the KUG Project, in recognition of the cultural importance of the lake to TKN.

AuRico initiated consultation with TKN regarding the KUG Project shortly after acquiring the Kemess property from Northgate Minerals. As described in Part C of the Assessment Report, TKN has advised the EAO that AuRico has consistently made good faith efforts to build a respectful and constructive relationship with TKN and overcome the mistrust within TKN communities that was created by Northgate's KN proposal. TKN have been working collaboratively with AuRico in relation to the EA of the KUG Project under their Interim Measures Agreement and Environmental Assessment Conduct Agreement.

### Collaboration with TKN

On April 2, 2015, BC and the Carrier Sekani First Nations (CSFNs) entered into a Collaboration Agreement (Collaboration Agreement). TLFN is a signatory to the agreement, which provides a framework for BC and the CSFNs to engage in collaborative decision-making for major projects.

The Collaboration Agreement between BC and the CSFNs commits the parties to seek (i) to develop consensus recommendations in relation to the design and implementation of EAs and regulatory review processes in relation to major approvals, and (ii) consensus in relation to decisions on major approvals.

Due to the established relationships between the TKN First Nations (including TLFN), as well as between AuRico and TKN, the EAO extended and applied the commitments in the Collaboration Agreement to TKN as a collective for the purpose of the EA of the KUG Project. Through this collaboration, the EAO and TKN jointly drafted Part C of the Assessment Report which describes collaboration and engagement with TKN, and came to general agreement on the conditions appropriate to propose for the EAC. TKN

and the Province have to date agreed during the permitting phase of the KUG Project to collaboratively consider how issues raised around potential effects may be better and further addressed in permitting.

TKN notes that with its focus on a government-to-government (G2G) relationship, recognition of TKN's role as stewards of its traditional lands, and striving for consensus where possible, the collaboration plan for the EA of the KUG Project enabled TKN's views, concerns and interests to be presented and considered in a respectful, constructive and effective manner.

TKN and the EAO plan to build on the success of the Collaboration Plan by exploring a longer term collaboration plan for the KUG Project that may include collaboration on future amendments to and oversight of implementation of the conditions of an EAC for the KUG Project, should an EAC be granted. The Province is also building on the collaborative relationship the EAO has established with TKN during the EA of the KUG Project through pursuit of a collaboration plan for the permitting phase of the KUG Project, a G2G table for additional matters beyond the EA or permitting processes for the KUG Project and Economic and Community Development Agreements (ECDA) for the KUG Project with TKN First Nations.

On February 10, 2017 EAO received a letter of support from TKN acknowledging the efforts of the EAO and AuRico to constructively engage with TKN throughout the EA and expressing TKN's collective and individual support for issuing the KUG Project an EAC.

#### **4. Environmental Assessment Process**

In conducting this EA, the EAO considered the potential environmental, economic, social, heritage and health effects, including cumulative effects, of the KUG Project for the provincial EA under the Act and the requirements under CEAA 2012 for the federal EA.

The EAO has conducted the EA of the KUG Project in consultation with an advisory Working Group made up of federal, provincial and local government representatives, with the mandates and skill sets relevant to the review of the KUG Project, as well as representatives of TKN.

EAO undertook public consultation activities during the course of the EA, including holding three public comment periods. All public comments and AuRico's responses to these comments, were considered in completing the EA.

As the KUG Project is a modification of the KS EAC, the proposed changes would normally be subject to an amendment process, and not trigger a new EA. However, in order to ensure the KUG Project would benefit from the same structure and process of an EA as for a project that met the thresholds in the *Reviewable Projects Regulation*, AuRico formally requested to the EAO that the KUG Project be designated as a reviewable project and the EAO granted this request on February 7, 2014.

The KUG Project triggers a federal EA under CEAA 2012, as it exceeds the production thresholds for a gold mine of 600 tpd, as set out in subsections 16(a) and 16(c) of the *Regulations Designating Physical Activities* and the Agency is of the view that the KUG Project should be considered a new mine.

On May 14, 2014, the EAO issued an Order under Section 11 of the Act, which set out the scope, procedures and methods for the EA. The Section 11 Order was modified by issuance of three Section 13 Orders on June 23, 2014 (to add Kwadacha First Nation to Schedule B of the Section 11 Order), November 19, 2014 (to add a public comment period for the valued component (VC) proposal document) and December 21, 2016 (to reflect changes to the project scope, additional public comment period on the draft Assessment Report and proposed EAC conditions and additional measures for consultation and accommodation of Aboriginal groups including the EAO and TKN collaboration).

The EAO required AuRico to develop a VC Selection Document which was provided for review by the advisory Working Group and the public. The VCs, and the information that must be collected, analyzed and presented by AuRico in their Application for an Environmental Assessment Certificate (Application), were identified by AuRico in the draft Application Information Requirements (AIR) document. The draft AIR was reviewed by the advisory Working Group and on January 11, 2016, the EAO issued the final AIR for the KUG Project.

The Application Review stage of the EA started on May 11, 2016, following a 50-day evaluation of the Application against the AIR by the EAO and the advisory Working Group. The advisory Working Group and public provided additional review and comment on the Application, supplementary materials, draft Assessment Report and proposed EAC conditions during the Application review stage.

EAO completed the review of the KUG Project and on February 16, 2017, referred the Application for decision to the Minister of Environment and Minister of Energy and Mines, and provided the final referral package to the Agency.

## Other Required Authorizations

If an EAC is issued, the KUG Project would also require various permits from federal and provincial governments. The majority of provincial permits would be provided through the Ministry of Energy and Mines (MEM), the Ministry of the Environment (ENV), and the Ministry of Forests, Lands and Natural Resource Operations (FLNRO). The only anticipated federal permits would be authorizations under the *Explosives Act* by Natural Resources Canada. In May 2015, Environment and Climate Change Canada clarified that a Schedule 2 amendment under the Metal Mining Effluent Regulation would not be required for the KUG Project as the KUG Project TSF does not contain water frequented by fish.

## **5. Key Conclusions of the Environmental Assessment**

EAs in BC use VCs as an organizing framework for the assessment of the potential effects for proposed projects. VCs are components of the natural and human environment that are considered by the proponent, public, Aboriginal groups, scientists and other technical specialists, and government agencies involved in the assessment process to have scientific, ecological, economic, social, cultural, archaeological, historical or other importance. The selection and assessment of VCs also takes into consideration the factors relevant to Sections 5(1) and 5(2) of CEAA 2012. To ensure effective use of resources and appropriately focus on the potential for significant adverse effects, the EAO selects VCs that evaluate the project-environment interactions of the greatest importance and consequence.

The EAO's Assessment Report is organized around the EA pillars (environmental, economic, social, heritage and health) and selected VCs:

- Climate Change (Section 3.2);
- Hydrogeology, Surface Hydrology, Surface Water Quality (Section 3.3);
- Terrain and Soils, Terrestrial Ecology (Section 3.6);
- Fish and Aquatic Habitat (Section 3.4);
- Wildlife (Section 3.5);
- Social and Economic (Section 4);
- Human Health (Section 5);
- Heritage Resources (Section 6); and
- Effects of changes to the environment on Aboriginal peoples (Section 10).

The EAO's Assessment Report assesses the impacts of the KUG Project on all VCs, identifies key mitigation measures for each, and reaches conclusions on their residual effects. The assessment also considered how accidents and malfunctions (section 7) and effects of the environment (section 8) could affect these VCs. The assessment required under CEAA 2012 is discussed separately (section 10). These assessments were based on the Application, comments from the advisory Working Group and Aboriginal groups.

To ensure the effects of the KUG Project are sufficiently mitigated, the EAO proposes 33 conditions to be included in the EAC, if issued, along with a Certified Project Description. Appendix A of this Summary Assessment Report summarizes the EAO's conclusions and key proposed conditions for each VC. The remainder of this section provides a summary of some of the key issues and concerns that were the focus of the EA. A detailed discussion of the assessment of each VC can be found in the Assessment Report.

### Groundwater Divide

The Application indicates that there is a groundwater divide between East and Central Cirque creeks. AuRico predicts that due to project design (including post-closure decline plugs to enable the re-flooding of the underground mine cave area) there would be no water quality impacts from the underground mine to Amazay Lake as there would be no pathway for a potential effect. Amazay Lake is a sacred area for TKN, used for vision quests, spiritual journeys, social gatherings, hunting and fishing. The KUG Project was designed (redesigned from KN) to have no effects to Amazay Lake due to its cultural importance to TKN.

During the EA, MEM posed a variety of questions about the level of confidence of the existence of this groundwater divide due to the current level of groundwater monitoring, and technical concerns about the groundwater model. AuRico conducted additional analyses to determine the potential for water quality effects due to seepage from the underground mine area to Amazay Lake, including a hypothetical scenario in which no groundwater divide existed. AuRico found that the potential for any material water quality impacts on Amazay Lake would be extremely unlikely, however there remained concern from TKN about the impact to Amazay Lake if AuRico's predictions were not realized, and that TKN communities may still perceive effects regardless of AuRico's analysis. Given the importance of Amazay Lake to TKN, the EAO is proposing an EAC condition requiring AuRico to develop an Amazay Lake monitoring plan including surface and groundwater monitoring, in consultation with FLNRO, MEM, ENV and TKN to ensure the EA predictions are accurate and there are no adverse effects on Amazay

Lake.

## Water Quality

Waste rock and tailings from the mining process would be stored in the KUG Project TSF. Water quality could be affected by the KUG Project through a variety of activities, such as the development of decline access tunnels; panel cave development and mining; discharging excess water from the KUG Project TSF; excavating and exposing potentially acid generating material; and flooding of the underground cave in closure and post-closure. AuRico would treat water during construction and operations for selenium, and in operations for selenium and metals prior to discharge from the KUG Project TSF.

Under current conditions in Waste Rock Creek there are elevated (above Water Quality Guidelines (WQG)) levels of total selenium, total aluminium and nitrate due to the effects of the past-producing KS. The EAO concluded that there would be residual effects from the KUG Project to surface water quality around the KUG Project TSF area in Attichika Creek and Waste Rock Creek (including selenium, total aluminium and nitrate), and around the underground mine area in East and Central Cirque Creeks. All residual effects would occur during closure or post-closure, except in Attichika Creek where residual effects are predicted during construction and operations. The EAO considered residual effects to be those parameters that would increase by at least 10% from the KUG Project and which would be above WQG.

During the EA, the advisory Working Group raised a number of issues regarding AuRico's water quality predictions, water treatment and discharge proposals. MEM and TKN posed questions about potential uncertainties in the geochemical source terms used in the water quality model, which could alter the level of certain parameters in water quality predictions and acidification of the rock units in the cave zone. Concerning water treatment and discharge, TKN requested that AuRico commit to meeting WQG and long-term water treatment and recommended the establishment of a selenium concentration limit for Waste Rock Creek that is protective of aquatic life, in consideration of elevated levels of selenium from KS.

AuRico provided additional explanations regarding derivation of the geochemical source terms, sensitivity analyses on potential loadings of parameters to the KUG Project TSF, and had an external review related to the potential for acidification of the rock units in the cave zone. The EAO found that this additional information was satisfactory for the purposes of the EA as it increased the EAO's confidence in the water quality predictions in the Application. The EAO notes that in the Application, water treatment was the basis for the analysis and the EAO has no information on what the potential effects of the

KUG Project would be in the absence of treatment. Given the premise on which the EA was based, as well as TKN's concerns, the EAO is proposing an EAC condition requiring AuRico to treat the effluent from the TSF for metals and selenium to meet WQG or Science Based Environmental Benchmarks. Concerning selenium in Waste Rock Creek, in consideration of TKN's strong concern about this issue, the already high levels of this parameter in the creek and AuRico's commitment that the KUG Project would not incrementally increase selenium concentrations in the creek, the EAO is proposing an EAC condition that would require AuRico to ensure that selenium concentrations of the discharge to Waste Rock Creek from the KUG Project TSF during post-closure would not increase selenium concentration in Waste Rock Creek.

The EAO is also proposing an EAC condition that would require AuRico to establish an Environmental Monitoring Committee (comprised of AuRico, TKN and regulators), which would discuss a variety of topics of interest to TKN including water management, water quality and other key EA concerns. The Environmental Monitoring Committee would provide a forum where AuRico would document how it addressed these issues during detailed design for its permitting applications and in the development of management plans.

In consideration of the EAC condition requiring water treatment, the condition to avoid any adverse incremental effects to Waste Rock Creek from selenium, the condition to monitor ground and surface water for potential impacts to Amazay Lake and the condition to create the Environmental Monitoring Committee to address a variety of issues of importance to TKN, the EAO concludes that there will not be significant adverse effects to water quality.

### Water Balance

During construction through to closure, groundwater flowing into the underground mine area would be pumped out, used for ore-processing and sent to the KUG Project TSF for storage, treatment (during operations and closure) and released. The Application predicts the rate at which water would flow into the underground mine based on a variety of parameters and using a groundwater model. The accuracy of these predictions is important, within a range of error, as this will affect the amount of water that is sent to the KUG Project TSF (which has a limited capacity).

During the EA, TKN, MEM and ENV expressed concerns about the potential underestimation of the mine dewatering flow estimates (the amount of water flowing into the cave area) due to the use of input values that they considered to be insufficiently conservative or inadequate. TKN questioned whether the KUG Project TSF and water

treatment facility would have the capacity and capability to accommodate higher inflows. AuRico conducted additional analyses with different input parameters, in addition to increasing the dewatering rate by two and five times. They concluded that the reasonable upper limit to dewatering rates at the end of operations would be about 20% higher than the base case value in the Application. Additionally, AuRico noted that the water treatment is modular, so additional volumes of water could be treated prior to discharge if needed and that the KUG Project TSF would have excess water storage capacity throughout most of operations.

Given the sensitivity analyses AuRico conducted, the additional storage capacity in the KUG Project TSF, the ability of the proposed treatment to treat at a higher rate, if necessary, and the fact that more refined modelling would be conducted during the *Mines Act* and *Environmental Management Act* permitting stage to predict water balance on site, the EAO is satisfied that this issue has adequately been addressed for the EA stage.

### Fish and Aquatic Habitat

Fish and aquatic habitat would be affected by the KUG Project through changes in water quality and water quantity from effluent discharge in Attichika Creek during construction, operations and closure and Waste Rock Creek during post closure. Three main issues were identified by the advisory Working Group, specifically the initial dilution zone (IDZ) of the effluent discharge in Attichika Creek, fish habitat offsetting for the effluent discharge into Attichika Creek and fish monitoring requirements.

TKN and FLNRO raised concerns regarding the IDZ related to minimizing potential habitat loss from changes to water quality around the discharge pipe location. The IDZ and habitat loss issues were resolved through the inclusion of a condition requiring AuRico to engage with TKN on the design of the diffuser, minimize the length of the IDZ, in addition to monitoring and implementation of mitigation measures for observed effects to fish habitat use from the IDZ and a condition requiring discharge from the KUG Project TSF to Attichika Creek during construction be staged on a monthly basis to a volume proportional to the Attichika Creek monthly streamflow and the discharge restricted to the open water months.

TKN raised concerns that concentrations of some water quality parameters (i.e. selenium and mercury) in other waterbodies could also be elevated, or may bio-accumulate. This was in part due to the perception within TKN that the presence of elevated levels of mercury in bull trout in Thutade Lake indicates that fish (or at least bull trout) in Thutade Lake and the surrounding watershed are or may be contaminated.

The EAO proposes an EAC condition for a Fish and Aquatic Effects Monitoring Plan that would include monitoring of concentrations of bio-accumulative contaminants in bull trout in Thutade Lake, to be developed in consultation with FLNRO, ENV and TKN. In consideration of these conditions, the EAO is satisfied that there will not be significant adverse effects to fish and aquatic habitat.

### Wildlife

The KUG Project footprint including buffers around infrastructure is 487 ha; less than 100 ha of which is attributable to the infrastructure itself. As a result of this land disturbance and increased human activity in the KUG Project area (for example, the use of machinery, vehicles, lighting) the EAO concludes that there will be residual effects to a variety of wildlife species through habitat loss and alteration, disruption to movement, sensory disturbance, direct mortality, attractants and indirect mortality. The predictions of these impacts are based on knowledge of animal presence and use of the KUG Project area and habitat suitability models.

During the EA, the advisory Working Group raised concerns about inadequate baseline data for birds, bats and western toads. An uncertain baseline creates uncertainty in the effects assessments for these species and challenges for creating appropriate mitigation measures, and designing effective monitoring of impacts during and after the KUG Project. In addition to concerns about baseline, the advisory Working Group brought up the concern that the habitat suitability models the Application relies on to predict effects to wildlife had not been verified in the field to understand the degree to which they accurately represent species' habitats. This too could create uncertainty in the predictions of effects on impacts to habitat.

In order to place some bounds on the uncertainties presented by inadequate baseline and unverified habitat models, AuRico provided additional information and conducted a variety of additional analyses to:

- assess the percentage of birds in the LSA potentially affected by the KUG Project using available data;
- assess if the predictions of habitat locations from the habitat models aligned with animal observations; and
- understand the amount of western toad habitat searched per year in different areas that might have western toad habitat.

The EAO concluded that the results of the additional analyses were largely consistent with the information presented in the Application and added confidence to AuRico's

wildlife effects assessments. In order to mitigate a variety of concerns related to baseline data and potential effects on wildlife, the EAO is proposing a wildlife management and monitoring plan as an EAC condition. This plan would be developed by a qualified professional in consultation with TKN and regulators and would be comprised of a variety of specific measures recommended by the advisory Working Group, such as pre-clearing survey requirements for western toads, raptors, bats and migratory birds, and the establishment of buffers around breeding habitats for western-toad, bat hibernacula and active bird nest sites. In consideration of the generally low-moderate magnitude impacts on wildlife and the comprehensive wildlife management and monitoring plan, the EAO concludes that there would not be significant residual effects to wildlife.

## Caribou

Caribou in the KUG Project area belong to two herds: the proposed Thutade herd for caribou around the mine site, and the Chase herd for caribou around the ORAR. The FLNRO proposed Thutade herd is part of the northern mountain population, which is listed as Special Concern under the *Species at Risk Act* (SARA), whereas the Chase herd is listed as threatened.

The EAO predicts that there would be residual effects to caribou from the KUG Project from habitat loss and alteration (from KUG Project infrastructure), disruption to movement (through the installation of linear components in the access corridor and water discharge line), sensory disturbance (from light and noise from various activities) and indirect mortality along the ORAR (from increased risks from predation due to snow clearing of the ORAR in winter).

During the EA, Environment and Climate Change Canada's Canadian Wildlife Service (CWS), FLNRO and TKN raised a variety of concerns related to AuRico's assessment of potential impacts to caribou. One of the primary caribou issues in the EA was the potential effects of the KUG Project on critical habitat (CH) for the Chase herd. In 2016, CWS provided updated mapping of CH for the Chase herd which had been identified within the 2014 Southern Mountain Caribou recovery strategy. The 2016 draft mapping of CH within the 2014 Chase local population unit (LPU) boundary flanks most of the ORAR where AuRico is the sole permit holder. As well, the 2016 mapping included candidate CH north of the 2014 LPU boundary (extending into the proposed Chase Recovery Planning Area (RPA; McNay et. al, 2008)) which overlapped with the KUG Project mine site. Subsequently, the caribou sub-Working Group concluded that the Chase herd did not overlap the mine site. The Chase herd 2014 CH was considered in the assessment of potential impacts from the ORAR in the Application and subsequent

memos from AuRico, as much of this CH has been incorporated into provincially designated ungulate winter ranges.

In order to reduce the potential impacts to caribou, the EAO is proposing a caribou management and monitoring plan as an EAC condition (as part of the broader wildlife management and monitoring plan). This plan would include a broad range of mitigations, such as mitigation of restrictions to and monitoring of caribou movement, opportunities to support caribou habitat through reclamation, measures to decommission roads, close off access to, and reduce opportunities for movement of caribou predators, participation in mitigation and monitoring initiatives that may be developed by provincial or federal agencies to understand and mitigate risks to caribou and its habitat and monitoring of the effectiveness of mitigation measures. The EAO is also proposing a condition requiring AuRico to enter into an agreement with FLNRO that would set out the terms of AuRico's participation in a program of activities that supports the conservation and management of caribou in the KUG Project area. The agreement may require AuRico to contribute up to \$30,000 toward the cost of implementing the program. In consideration of the low to moderate magnitude of residual effects to caribou, the proposed conditions for a caribou management and monitoring plan and agreement with FLNRO, existing and potential future provincial mitigations as discussed in the Assessment Report, the EAO concludes that residual adverse effects to caribou would be not significant.

### Tailings Alternatives Assessment

As described in Part A of the Assessment Report, AuRico conducted a tailings alternatives assessment, as required by the EAO, with respect to options for tailings management, and considering technology, siting and water balance. TKN stated their preference for a tailings management option that did not require a dam such as thickened tailings, as this would eliminate the need for ongoing maintenance of the dam in the closure and post-closure stages and reduce concerns about a potential dam breach. AuRico responded by noting that due to environmental, geotechnical and economic considerations this option was not pursued for the KUG Project.

The EAO found AuRico's tailings alternative assessment to meet the requirements set out by the EAO in its March 19, 2015 letter, which required AuRico to assess options for tailings management that consider technology, siting and water balance. The EAO is satisfied that AuRico has reasonably considered the alternatives for tailings and waste rock management. The EAO also notes that economic and technical aspects of tailings management alternatives were some of the factors AuRico was required to consider, and so finds AuRico's response to TKN's preference for an option with no dam to be

satisfactory. The EAO also notes that recent updates to the TSF requirements in the Health, Safety and Reclamation Code for Mines in British Columbia, which include design and operations requirements for water management and seismic issues, would set a high standard of safety for the KUG Project TSF.

## **6. Aboriginal Consultation**

The EAO examined potential impacts of the KUG Project on asserted or established Aboriginal rights including title and treaty rights (Aboriginal Interests). Throughout the EA, the EAO consulted with:

- Takla Lake First Nation;
- Tsay Keh Dene Nation;
- Kwadacha First Nation;
- Gitxsan: wilp Nii Kyap;
- Treaty 8 First Nations:
  - Doig River First Nation,
  - Halfway River First Nation,
  - Saulteau First Nation,
  - West Moberly First Nation,
  - Fort Nelson First Nation,
  - Blueberry River First Nation,
  - Prophet River First Nation,
  - McLeod Lake Indian Band; and
- Métis Nation British Columbia (MNBC).

The First Nations comprising TKN were consulted at a deeper level, described below, and the other Aboriginal Groups listed above were consulted at a notification level.

### **Schedule C Aboriginal Groups**

The EAO met with Gitxsan on several occasions throughout the EA to discuss their view that the KUG Project is within their asserted traditional territory. Gitxsan provided comments during the final public comment period on the draft federal and provincial conditions. Details of the EAO's consultation with Gitxsan are in Part C of the Assessment Report. Halfway River First Nation was the only Treaty 8 First Nation to

provide comments on the Application. These comments are discussed in Part B and C of the Assessment Report. MNBC was consulted on behalf of the federal government. MNBC provided comments during the final public comment period on the draft federal and provincial conditions, which are discussed in Part C of the Assessment Report.

### Tse Keh Nay First Nations

As discussed in section 3, the EAO and TKN worked together to create a collaboration plan to facilitate collaboration on the EA within the spirit and intent of the Collaboration Agreement, including addressing the potential adverse effects of the KUG Project on any TLFN, TKD or KwN asserted Aboriginal title, rights, and interests within their respective traditional territories (Aboriginal title, rights, and interests of the TKN First Nations), in accordance with the Collaboration Agreement.

The EAO and TKN agreed early in Application Review that the primary focus of their engagement in the EA should be on collaboration and a non-adversarial, interest based approach. TKN and the EAO agree that the collaboration process for the KUG Project satisfied the requirements of the deeper end of consultation for the EA. However, TKN and the province agree that environmental and other accommodation measures may be required for the KUG Project to address outstanding impacts on the Aboriginal title, rights, and interests of the TKN First Nations. TKN and the province are currently pursuing discussions in relation to those measures at a separate G2G table that has been established outside of the EA process and through the permitting process for the KUG Project.

As part of this collaboration, the EAO and AuRico attended community meetings in Kwadacha and at Takla Landing early in Application Review. The purpose of the community meetings was to: (i) build understanding of the KUG Project, the EA process and how First Nations' interests and concerns are incorporated into the process and addressed; (ii) share the main themes of issues and concerns heard to date regarding the KUG Project; (iii) communicate how AuRico has considered concerns from these First Nations in the design of the KUG Project; and (iv) provide an opportunity for the First Nations to share additional information with AuRico and the EAO.

The EAO provided provincial and federal capacity funding to each of the TKN First Nations to support their participation and collaboration in the EA. TKN appointed technical representatives to the EAO's advisory Working Group and sub-committees. TKN provided technical comments on key EA documents, and met directly with the EAO to collaboratively resolve issues and concerns, and develop Part C of the Assessment Report and EAC conditions.

The EAO also assigned procedural aspects of consultation with TKN to AuRico. AuRico funded the technical representatives of TKN on the EAO's advisory Working Group. During the EA, consultation between AuRico and TKN was guided by an Interim Measures Agreement that established a Senior Implementation Committee and an Environmental Management Committee and seeks to identify business and employment opportunities for TKN. TKN have indicated that the support they have received to date from AuRico has enabled TKN to fully participate in the EA and has also served to foster trust and mutual understanding and respect between TKN and AuRico. TKN note that they are dedicated to further strengthening this relationship and close to agreement with AuRico on an Impact Benefit Agreement (IBA) for the KUG Project. The IBA is a progressive agreement that includes (among other things) commitments by AuRico on employment and training for TKN members, business opportunities for TKN businesses, a financial component, and a role for TKN in monitoring, assessing and managing the effects of the KUG Project on the environment and Aboriginal title, rights, and interests of the TKN First Nations. Like the Interim Measures Agreement, the IBA also establishes efficient and effective structures and mechanisms for ongoing collaboration by TKN and AuRico throughout the life of the KUG Project.

Some of the key concerns identified over the course of the EA by TKN related to effects to water quality, Amazay Lake, fish and fish habitat, wildlife including species of importance to TKN (e.g. hoary marmot and caribou), ecosystems and wetlands, and accidents and malfunctions, including dam design and safety.

TKN also identified potential impacts from the KUG Project to: resources used for gathering, hunting, fishing; alienation of lands from TKN's use due to access restrictions and areas disturbed by infrastructure and access corridors; deterrence to traditional use through TKN members' perception of risk relating to effluent and toxicity (environmental health) effects; and increasing competition for resources and increasing harvest of resources.

The EAO and TKN collaboratively developed proposed conditions for the EAC to address the potential impacts from the KUG Project to the Aboriginal title, rights, and interests of the TKN First Nations. These conditions include:

- Aboriginal Monitors Program: provides opportunities for individuals of TKN to participate in environmental monitoring of KUG Project activities;
- Environmental Monitoring Committee: AuRico would be required to establish an Environmental Monitoring Committee and invite TKN and regulators. The Environmental Monitoring Committee would discuss a variety of topics of interest to TKN including water management, water quality and other key EA concerns

and would provide a forum where AuRico would document how it addressed these issues during detailed design for its permitting applications and in the development of management plans;

- Selenium condition: to ensure that discharge to Waste Rock Creek from the KUG Project TSF during post-closure does not incrementally adversely affect selenium concentrations in Waste Rock Creek;
- Water Management: to require AuRico to treat the effluent from the KUG Project TSF for metals and selenium to meet WQG or Science Based Environmental Benchmarks;
- Fish and Aquatic Effects Monitoring Plan: to monitor concentrations of bio-accumulative contaminants in bull trout in Thutade Lake;
- Effluent Diffuser and Initial Dilution Zone Management condition: to require AuRico to engage with TKN on the design of the diffuser to show how it minimized the length of the initial dilution zone, and monitor and implement mitigation measures for any observed adverse effects of the initial dilution zone on fish habitat use;
- Amazay Lake Monitoring Plan: to monitor water quality of Amazay Lake and groundwater to detect groundwater movement from the underground cave/subsidence zone towards Amazay Lake to ensure there are no adverse effects on Amazay Lake;
- Wildlife Management and Monitoring Plan: to address effects to wildlife, alpine species, birds, bats and caribou and effects from use of the ORAR on wildlife; and
- Accidents and Malfunctions Communication and Administration Plans: to provide notification of accidents and malfunctions and implement mitigation for low environmental risk accidents.

In their letter of support for the KUG Project, TKN acknowledged the efforts made by EAO to listen to, consider and address TKN's concerns and interests, striving for consensus where possible throughout the EA. TKN's view is that, within the constraints of EA process, by and large TKN's concerns and interests were adequately addressed through that process when combined with other forms of accommodation with the province including proposed collaboration with permitting agencies, ongoing G2G discussions and the negotiation of ECDAs with TKN First Nations.

The EAO and TKN agree that the collaborative process has resulted in adequate mitigation and accommodation of the potential effects of the KUG Project on the

Aboriginal title, rights, and interests of the TKN First Nations at the EA stage.

The EAO and TKN agree that TKN has been meaningfully consulted and accommodated on the potential effects of the KUG Project at the EA stage. The Collaboration and Engagement with TKN First Nations Report (Part C of the Assessment Report), collaboratively drafted by the EAO and TKN, provides further analysis related to these conclusions.

The EA also considered potential social and economic effects to TKN, including potential neutral or positive effects. TKN's perspective on potential accommodations currently being discussed between the province and TKN and AuRico and TKN are discussed in the section 10, *Additional Considerations* below.

## **7. Public Consultation**

Public consultation requirements are intended to provide multiple, meaningful opportunities for the public to provide input. AuRico was required to prepare a Public Consultation Plan early in the EA that laid out AuRico's consultation objectives and activities. Through the course of the EA, AuRico submitted public consultation reports to the EAO describing the progress in implementing its Public Consultation Plan.

EAO held the following three public comment periods during the EA:

- A 41-day public comment period from November 26, 2014, to January 5, 2015, on the draft VC Selection Document. The EAO did not receive any public comments during this period.
- A 30-day public comment period from May 18 to June 17, 2016, on the Application. One public comment was submitted. The primary concerns raised in the comment related to water quality (particularly Amazay and Thutade lakes), health and safety of workers, roads through Aiken Lake and potential contamination from the TSF. The Proponent provided a response to this public comment, which is discussed further in the Assessment Report.
- A 30-day public comment period from January 11 to February 10, 2017, on the draft Assessment Report, draft conditions of an EAC and federal conditions of a Decision Statement. In total, seven submissions were received, including three on the whole package of documents and four on the federal conditions from AuRico, ENV, FLNRO and MEM, which were sent to the Agency for their consideration.

Given the lack of public comments during the pre-Application stage, the EAO did not host general public open houses during the Application Review stage, but instead

focused on participation in meetings in Aboriginal communities, as described in Section 6.

## **8. Local Government Consultation**

The following local and regional governments were invited to participate on the advisory Working Group: the District of MacKenzie, the Peace River Regional District, the Town of Smithers and Prince George.

The District of MacKenzie and the Peace River Regional District participated in the evaluation and the review of the Application. The Peace River Regional District raised the following issues during Application review (the District of McKenzie did not submit any comments):

The Peace River Regional District was concerned that the KUG Project could create a residual effect of stress on families. The KUG Project would transport workers to and from the mine site by air and workers could come from a variety of communities, termed a “fly-in, fly-out” (FIFO) operation. AuRico has proposed mitigation measures based on best practices in the mining industry to support employees and families to reduce stress associated with FIFO, including the Health and Wellness Management Plan. The EAO proposes an EAC condition for a Socio-Community and Economic Management Plan to describe AuRico’s plans for communicating and engaging with the community; the process for issues management; and the means by which the Health and Wellness Management Plan and the Employee and Family Assistance Program would be implemented. Considering the proposed condition for a Socio-Community and Economic Effects Management Plan, the EAO is satisfied that there would not be significant residual social effects from the KUG Project.

## **9. Federal Government Perspectives**

The following federal departments with specialist information or expert knowledge relevant to the KUG Project participated in the evaluation and the review of the Application:

- The Agency provided guidance and information directly to the EAO regarding the substituted process and federal EA requirements under CEAA 2012, but did not directly participate in the advisory Working Group;
- Environment and Climate Change Canada provided comments and information related to their regulatory and statutory responsibilities related to wetlands, terrestrial ecosystems, wildlife resources, surface water quality, air quality, greenhouse gas management, accidents and malfunctions, geology and geochemistry;

- Health Canada provided advice and information related to their regulatory and statutory responsibilities regarding human health (including Aboriginal health); and
- Natural Resources Canada provided advice and information related to their expertise in seismicity, geotechnical issues and geohazards.

For the purposes of the substituted federal EA, the EAO considered effects that the KUG Project may have on the components described in CEAA 2012 sections 5(1) and 5(2), as well as in SARA section 79(2). Specifically, the EAO conducted the following assessments (see section 10 of the Assessment Report):

- CEAA 2012 section 5(1)(a): assessment of changes the project may cause to several federal areas of responsibility: fish and fish habitat; aquatic species; and migratory birds;
- CEAA 2012 section 5(1)(b): assessment of a change that may be caused to the environment by the Project that may arise on federal lands, other provinces, or outside of Canada;
- CEAA 2012 section 5(1)(c): assessment of any change to the environment caused by the Project on Aboriginal peoples': health and socio-economic conditions; physical and cultural heritage; the current use of lands and resources for traditional purposes; or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;
- CEAA 2012 section 5(2)(a): assessment of changes to the environment that are related to the exercise of a power or performance of duty or function by a federal authority; and
- SARA section 79(2): the identification of adverse effects of the project on the SARA-listed wildlife species and its critical habitat and associated mitigation and monitoring measures.

In addition to the conditions proposed by the EAO, the federal government will be proposing conditions related to the above federal requirements, which would become legally binding if the KUG Project is approved by Canada.

## **10. Additional Considerations**

Ministers may consider other matters that they consider relevant to the public interest in making their decision on whether to grant an EAC to AuRico. The following information regarding the potential economic benefits of the KUG Project were presented in AuRico's Application.

## Economic Benefits

The KUG Project would have substantial economic benefits over the construction phase (5 years) and operations phase (12 years), as well as lesser benefits over the closure phase (6 years), which are not enumerated here. AuRico assessed direct expenditures and employment as well as indirect (supply chain) and induced (spending by workers) impacts. Table 1 summarizes total impacts for Canada including Gross Domestic Product (GDP), employment and income, as well as government tax revenue.

AuRico estimates that, as a result of more than \$1,083.9 million in direct and indirect expenditures during construction, total GDP impacts are estimated at \$537 million. During construction, AuRico predicts that the KUG Project would create a total of 5,730 jobs (an average of 1,146 jobs per year), increasing household income by \$383.5 million. Additionally, federal, provincial and local government tax revenue generated from the sale of inputs and outputs as well as personal income tax are estimated to be \$106.9 million.

During operations, AuRico estimates that total GDP benefits to the provincial and national economy would be valued at \$1,875.3 million as a result of more than \$3,546.9 million in direct and indirect expenditures over that period. AuRico predicts that the KUG Project would create 16,708 jobs (an average of 1,392 jobs per year) and \$1,287.5 million in household income during operations, benefiting workers from the province and beyond. Finally, overall federal, provincial and local tax revenue would increase by \$567 million, including \$251.6 million of direct project taxes, which include property taxes, provincial and federal corporate tax, as well as the BC mineral tax.

Overall, the construction and operation of the KUG Project would provide substantial economic benefits to the province of BC and Canada in general.

**Table 1: Summary of KUG Project Economic Benefits during Construction and Operations**

	GDP (million)	Employment (numbers)	Income (million)	Tax Revenue (million)
<b>Construction</b>				
Direct KUG Project Contribution	\$158	1,484	\$151	\$49
Indirect and Induced Impacts	\$379	4,246	\$233	\$58
<b>Operations</b>				
Direct KUG Project Contribution	\$604	4,452	\$593	\$390 <sup>a</sup>

Indirect and Induced Impacts	\$1,271	12,256	\$694	\$177
<b>Total</b>	<b>\$2,412</b>	<b>22,438</b>	<b>\$1,671</b>	<b>\$674</b>

a. During operations, tax revenue includes taxes paid directly by the KUG Project (e.g., corporate taxes, and mineral taxes) in addition to the revenue from consumption and personal income taxes, which occurs during construction and operations.

### Potential Benefits to Affected Aboriginal Communities

The Collaboration Plan adopted by TKN and the EAO for the KUG Project EA contains a commitment by TKN and the EAO to: (i) collaborate in developing Part C of the Assessment Report; (ii) strive for consensus on the proposed conditions for an EAC; and (iii) seek to develop consensus recommendations to the ministers in relation to their decision on the KUG Project. Through this collaboration by TKN and the EAO, general agreement was reached by TKN and the EAO on the proposed conditions (Schedule B) as described above in section 6. TKN views this willingness by the EAO to include conditions proposed or supported by TKN in Schedule B as a form of accommodation. TKN's view is that within the constraints of the EA process, by and large, TKN's concerns and interests were adequately addressed through that process when combined with other forms of accommodation.

An agreement in principle exists between TKN and the province to create a G2G table to consider and, where appropriate, address specific issues or concerns identified by TKN in relation to the KUG Project and surrounding area. These include issues and concerns that cannot be adequately addressed through the EA or permitting processes for the KUG Project including effects on the Aboriginal title, rights, and interests of the TKN First Nations that cannot be avoided, should the KUG Project proceed. Matters being discussed relate to management of lands at Thutade Lake and Amazay Lake, monitoring and management of the ORAR and access for TKN members to training programs and services to qualify them for jobs at the KUG Project. TKN and the province are close to finalizing an agreement that establishes the G2G table and how the G2G process will proceed.

The province has committed in writing to negotiate an ECDA for the KUG Project with TKN First Nations. Under this agreement, the province outlines how it intends to share mineral tax revenues from the KUG Project with TKN if the KUG Project is eventually developed and operated. Negotiations on the ECDA are ongoing and are led by TKN and provincial representatives. TKN expects that ECDAs for each of the TKN First Nations will be concluded in a timely manner. TKN's view is that the ECDAs for each of the First Nations will contribute to accommodation for the KUG Project's effects on the Aboriginal title, rights, and interests of the TKN First Nations.

As noted above in section 6, AuRico and TKN are close to agreement on an IBA for the KUG Project.

The KUG Project has the potential to produce substantial long-term benefits for TKN First Nations. TKN is of the view that these benefits (if they are actualized) outweigh the risks associated with the potential effects of the KUG Project on the environment and the Aboriginal title, rights, and interests of the TKN First Nations.

In general, the potential benefits to TKN collectively and individually from the KUG Project may include the following (assuming an IBA with AuRico is concluded and agreement is reached with the province on other forms of accommodation):

- School based initiatives to improve educational outcomes for TKN members (IBA);
- A broad range of employment and training initiatives for TKN members (IBA);
- Business opportunities for TKN businesses during construction and operation of the KUG Project (IBA);
- New partnerships, joint ventures and other arrangements by TKN with companies and businesses that intend to bid on contracts to supply goods and services to the KUG Project;
- Financial benefits to TKN communities from the IBA and ECDA that will support the TKN communities in addressing their infrastructure needs and community-based programs and services (e.g. housing, health and wellness, etc.);
- Increased capacity for governance within the TKN First Nations through participation in the processes established under the IBA and G2G agreements or other arrangements with the province; and
- Respect for Aboriginal title, rights, and interests of the TKN First Nations.

## **11. Conclusion**

Based on:

- Information contained in the Application and supplemental information provided during Application Review;

- AuRico's and the EAO's efforts at consultation with potentially affected Aboriginal groups, government agencies, and the public, and its commitment to ongoing consultation;
- The EAO's collaborative approach to working with TKN to resolve project-specific issues, assess the potential adverse effects of the KUG Project on the Aboriginal title, rights, and interests of the TKN First Nations and seek consensus on proposed conditions and recommendations to Ministers;
- Comments on the KUG Project made by TKN and government agencies as members of the EAO's advisory Working Group, and AuRico's and the EAO's responses to these comments;
- Comments received during the public comment periods, and AuRico and the EAO's responses to these comments;
- Issues raised by TKN regarding potential impacts of the KUG Project and AuRico's responses and best efforts to address these issues;
- The design of the KUG Project as specified in the proposed Schedule A (CPD) of the EAC to be implemented by AuRico; and
- Mitigation measures identified as proposed conditions in Schedule B (TOC) of the EAC to be undertaken by the AuRico.

The EAO is satisfied that:

- The EA has adequately identified and assessed the potential adverse environmental, economic, social, heritage and health effects of the KUG Project, having regard to the proposed conditions set out in Schedule B (TOC) to the EAC;
- Consultation with TKN, other Aboriginal groups, government agencies, and the public, which were within the scope of the EA, and the distribution of information about the KUG Project, has been adequately carried out by AuRico and that efforts to consult with TKN will continue;
- Issues identified by TKN, other Aboriginal groups, government agencies and the public, which were within the scope of the EA, were adequately and reasonably addressed by AuRico during Application review;
- Practical means have been identified to prevent or reduce any potential adverse environmental, social, economic, heritage or health effects of the KUG Project such that no direct or indirect significant adverse effects is predicted or expected; and

- The provincial Crown has fulfilled its obligations for consultation and accommodations to potentially affected Aboriginal groups relating to the issuance of an EAC for the KUG Project.

In addition, EAO notes that:

- TKN and EAO agree that the collaborative process has resulted in adequate mitigation and accommodation of the potential effects of the KUG Project on the Aboriginal title, rights, and interests of the TKN First Nations at the EA stage.
- TKN has provided a letter of support to the EAO for issuing the KUG Project an EAC and requested that the EAO convey this support to the Minister of the Environment and the Minister of Energy and Mines (the Ministers).

The Ministers will consider this Summary Assessment Report, the Assessment Report and other accompanying materials in making their decision on the issuance of an EAC to AuRico under the Act. The Assessment Report, Summary Assessment Report and draft TOC will also be provided to the Agency for the federal Minister of Environment and Climate Change's decision on the EA of the KUG Project.

## Appendix A Summary of KUG Project Specific Issues and EAO Response/Conclusion

Section of Assessment Report	Summary of EAO's Assessment and Conclusions	EAO's Key Proposed Conditions
<b>Environmental Effects</b>		
Air Quality (s. 3.1)	<p>The Application identified that the primary sources of air emissions would be from the generation and airborne transport of fugitive dust particles and exhaust emissions due to equipment use. Emissions from the KUG Project would be regulated by a permit under the <i>Environmental Management Act</i> (EMA). The predictive modelling for air quality for the KUG Project produced contaminant concentrations that were all below the applicable federal and provincial air quality criteria, and these predicted air contaminant concentrations were used as inputs in the evaluation and assessment of other VCs.</p> <p>Issues related to the uncertainty in the amount of dust that would be generated by KUG Project components and the potential for air quality impacts from dust. Other air quality issues specifically related to human health are discussed in the Human Health section of this report.</p>	Condition 27 would require AuRico to develop an Air Quality Management Plan to monitor air quality and mitigate potential effects, including from dust.
Climate Change (s. 3.2)	<p>A separate Greenhouse Gas (GHG) Assessment Report (GHG Report) was submitted as a supplement to the Application. The majority of GHG emissions would arise from land clearing, stationary fuel combustion, fugitive emissions, and on-site transportation. The GHG Report predicts that total GHG emissions are estimated to be only a very small fraction of BC's estimated total GHG levels (2014) –less than 0.1%, and of Canada's estimated levels – less than 0.01%.</p> <p>AuRico will have GHG reporting requirements to both the</p>	Condition 27 would require AuRico to develop an Air Quality Management Plan to implement mitigation measures to reduce GHG emissions.

Section of Assessment Report	Summary of EAO's Assessment and Conclusions	EAO's Key Proposed Conditions
	<p>federal and provincial governments.</p> <p>Having regard to BC's Climate Action Plan, which includes the Carbon Tax that will apply at the start of the KUG Project, and considering EAO's proposed condition for an Air Quality Management Plan, the EAO is satisfied that the KUG Project is not likely to have significant adverse effects related to climate change.</p>	
Water (s. 3.3)	<p>The KUG Project could impact the water VCs through a variety of activities, such as: the development of decline access tunnels; panel cave development and mining; discharging excess water from the KUG TSF; excavating and exposing potentially acid generating material; and flooding of the cave in closure and post-closure. Surface water quality could be additionally impacted by erosion and sedimentation, nitrogen (N) loading from explosives and atmospheric dust deposition from various mining activities and equipment use. The KUG Project could potentially impact the following watercourses and water bodies in proximity to the proposed mine due to the above noted activities: Attichika, Attycelley, East Cirque, Central Cirque, Kemess, North Kemess, South Kemess and, Waste Rock creeks; Finlay River; Amazay and Thutade lakes.</p> <p>Key issues raised during the EA for water quality related to the groundwater divide between the cave subsidence zone and Amazay Lake, decline plugs, mine dewatering, geochemical source terms and water treatment. Considering EAO's proposed EAC conditions and the <i>Mines Act</i> (MA) and EMA permit application</p>	<p>Condition 20 would require monitoring water quality of Amazay Lake and groundwater monitoring to detect groundwater movement from the underground cave/subsidence zone towards Amazay Lake.</p> <p>Condition 21 would require AuRico to stage discharge from the TSF to Attichika Creek on a monthly basis to a volume proportional to the Attichika Creek monthly streamflow and restrict discharge to the open water months.</p> <p>Condition 16 would require AuRico to treat the effluent from the TSF for metals and Se to meet WQG or Science Based Environmental Benchmarks.</p> <p>Condition 19 would require AuRico to ensure that discharge to Waste Rock Creek from the TSF during post-closure would not incrementally increase Se concentrations in Waste</p>

Section of Assessment Report	Summary of EAO's Assessment and Conclusions	EAO's Key Proposed Conditions
	<p>requirements, the EAO is satisfied that the KUG Project would not have a significant adverse effect on water.</p>	<p>Rock Creek.</p> <p>The installation of decline plugs at closure is described in the Certified Project Description (CPD).</p> <p>Condition 13 would require AuRico to develop a Construction Environmental Management Plan (EMP), which would include requirements for sediment and erosion control measures.</p>
<p>Fish and Aquatic Habitat (s. 3.4)</p>	<p>Fish and aquatic habitat have the potential to be affected by the KUG Project during all phases as the KUG Project area encompasses several fish-bearing and non-fish-bearing streams, rivers, and lakes providing fish and aquatic habitat. Fish species provide an important food source for First Nations in the Regional Study Area (RSA). Potential effects to fish and aquatic habitat are related to project activities, specifically road and pipeline construction, water treatment, TSF dewatering, effluent discharge and outflow from the Se collection pond (SeCP).</p> <p>Key issues that arose during the EA related to AuRico's assessment of fish and aquatic habitat included the IDZ in Attichika Creek and fish monitoring requirements. Considering the EAO's proposed EAC conditions and the EMA permit application requirements, the EAO is satisfied that the KUG Project would not have a significant adverse effect on fish and aquatic habitat.</p>	<p>Condition 22 would require AuRico to develop a Fish and Aquatic Effects Monitoring Plan to monitor concentrations of bioaccumulative contaminants in bull trout in Thutade Lake.</p> <p>Condition 19 would require AuRico to ensure that Se concentrations of the discharge to Waste Rock Creek from the TSF during post-closure would not incrementally increase Se concentrations in Waste Rock Creek.</p> <p>Condition 23 would require AuRico to engage with TKN on the design of the effluent diffuser to show how it minimized the length of the IDZ, and implement mitigation measures for any observed adverse effects of the</p>

Section of Assessment Report	Summary of EAO's Assessment and Conclusions	EAO's Key Proposed Conditions
		IDZ on fish habitat use.
<p>Wildlife (s. 3.5)</p> <ul style="list-style-type: none"> <li>• Woodland caribou</li> <li>• Moose</li> <li>• Mountain goat</li> <li>• Grizzly bear</li> <li>• Furbearers</li> <li>• Hoary marmot</li> <li>• Bats</li> <li>• Raptors</li> <li>• Migratory waterbirds</li> <li>• Migratory landbirds</li> <li>• Western toad</li> </ul>	<p>The EAO identified that the KUG Project would adversely impact wildlife by causing habitat loss and alteration, disruption of movement, sensory disturbance, the introduction of attractants and direct and indirect mortality.</p> <p>Issues raised during the EA included the availability of baseline data, lack of model verification, thresholds for residual effects and potential impacts to caribou. With the proposed EAC condition, the EAO is satisfied that the KUG Project would not have significant adverse effects on wildlife.</p> <p>The EAO recognizes that there is a degree of uncertainty regarding potential impacts from the KUG Project on caribou due to incomplete information on caribou population trends, habitat use and predator dynamics in the region. However, the EAO is satisfied that these uncertainties can be addressed by the mitigation measures in the proposed condition requiring a caribou management and monitoring plan, and concludes that residual effects to caribou would not be significant.</p>	<p>Condition 25 would require AuRico to develop a Wildlife Monitoring and Management Plan, which would address effects to wildlife, alpine species, birds, bats, caribou and effects along the ORAR.</p> <p>Condition 26 would require AuRico to enter into an agreement with FLNRO regarding AuRico's participation in a program of activities that supports the conservation and management of caribou in the KUG Project area.</p>
<p>Terrestrial Environment (s. 3.6)</p> <p>Terrain and Soils:</p> <ul style="list-style-type: none"> <li>• Terrain stability</li> <li>• Soil quantity</li> <li>• Soil quality</li> </ul>	<p>The EAO identified the increased risk of geohazards due to subsidence and to footprint development in unstable or erodible terrain; loss of soil in subsidence area and under retained roads; and loss of soil quality in subsidence buffers, retained road buffers, and in reclaimed areas as residual effects to terrain and soils as a result of the KUG Project. In total, 46 ha of soil is expected to be</p>	<p>Condition 24 would require AuRico to develop a Wetlands Management and Monitoring Plan as part of the Ecosystems Management Plan.</p> <p>Condition 13 would require AuRico to develop a Construction EMP, which would include requirements for</p>

Section of Assessment Report	Summary of EAO's Assessment and Conclusions	EAO's Key Proposed Conditions
<p>Terrestrial Ecology:</p> <ul style="list-style-type: none"> <li>• Alpine and parkland ecosystems</li> <li>• Forested ecosystems</li> <li>• Wetland ecosystems</li> <li>• Red- and blue-listed ecosystems</li> <li>• Rare plants and lichens and associated habitat</li> <li>• Harvestable plants</li> </ul>	<p>permanently lost.</p> <p>The EAO identified direct and indirect effects including loss and alteration of harvestable plant habitat; loss of alpine and parkland ecosystem extent and function; alteration of alpine ecosystem function due to subsidence; loss of forested ecosystems through surface clearing and permanent infrastructure; and alteration of forested ecosystems through edge effects, on harvestable plants, alpine and parkland ecosystems, and forested ecosystems. An estimated 0.2 ha of wetland would be lost.</p> <p>Considering the proposed condition and mine site reclamation required for the KUG Project, the EAO is satisfied that the KUG Project would not have significant adverse effects on the terrestrial environment.</p>	<p>sediment and erosion control measures.</p>
<p>Socio-Economic Effects (s. 4)</p> <ul style="list-style-type: none"> <li>• Aboriginal labour market conditions</li> <li>• Non-Aboriginal labour market conditions</li> <li>• Community well-being</li> <li>• Aboriginal community well-being</li> </ul>	<p>Loss of employment at closure, and competition for skilled labour and wage inflation during construction and operations phases are expected to have a residual economic effect. The Aboriginal labour market may face disproportionately greater challenges finding new employment after mine closure.</p> <p>The impact of in-migration of workers to northern communities and transportation hubs, such as crime rates, cost of living, drug use and childcare availability, was a key concern discussed in the EA.</p> <p>Considering the proposed EAC conditions, the EAO is satisfied that the KUG Project would not have significant adverse effects on social or economic conditions.</p>	<p>Condition 30 would require AuRico to develop a Socio-community and Economic Effects Management Plan to describe AuRico's plans for communicating and engaging with the community; the process for issues management; and the means by which the mitigations proposed by AuRico, would be implemented.</p> <p>Condition 29 would require AuRico to develop a Health and Medical Services Plan (HMSP) conforming to Northern Health's "Health and Medical Services Plan Best</p>

Section of Assessment Report	Summary of EAO's Assessment and Conclusions	EAO's Key Proposed Conditions
		Management Guide for Industrial Camps".
<p>Human Health Effects (s. 5)</p> <ul style="list-style-type: none"> <li>• Noise</li> <li>• Air Quality</li> <li>• Drinking water quality</li> <li>• Country foods quality</li> </ul>	<p>The KUG Project would generate noise and release pollutants into the air, soil and water possibly impacting human health. Drinking water, particulate matter (PM) exposure, metals in dust, exposure to contaminants of potential concern (COPC) in country foods and the conservativeness of estimates within the Human Health Risk Assessment (HHRA) were the key issues identified by the EAO.</p> <p>With the proposed EAC conditions, the EAO is satisfied that the KUG Project would not have a significant adverse effect on human health.</p>	<p>Condition 27 would require AuRico to develop an Air Quality Management Plan with mitigation measures to reduce PM levels.</p> <p>Condition 28 would require AuRico to provide details to Northern Health on potential groundwater effects to inform Northern Health's drinking water permitting process.</p>
Heritage Effects (s. 6)	<p>Only one known archeological site is expected to be impacted by the KUG Project and this site has already been disturbed. The EAO is satisfied that no residual effects are expected to heritage resources, including as yet unknown archaeological sites, from the KUG Project after mitigation. AuRico has provided a Heritage Resources Management Plan describing the course of action that would be taken prior to upgrading the road where the disturbed site is located as well mitigation procedures for additional sites, should they be discovered. The EAO understands that the procedures, mitigations and other measures proposed in the plan are requirements of the <i>Heritage Conservation Act</i> (HCA) and the MA.</p>	None
Accidents and	During construction and operation of the KUG Project, unplanned events could occur that would result in effects	Condition 17 would require AuRico to develop an Accidents and

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Malfunctions (s. 7)	<p>to surface water quality, terrain and soils, terrestrial ecology, fish and aquatic habitat, wildlife, human health and use of the land and resources for traditional purposes. Unplanned events could arise from accidents or malfunctions associated with proposed KUG Project activities or from environmental events or processes, which could have adverse effects on the KUG Project.</p> <p>Key issues that arose during the EA regarding accidents and malfunctions included potential failure of the KUG TSF East Dam, the analysis methodology for assessing accident risk, engagement with TKN and conditions for EMPs.</p> <p>Considering the likelihood of occurrence and based on the combination of proposed KUG Project design measures, mitigation measures, and proposed conditions, the EAO concludes that the KUG Project is not likely to result in significant adverse environmental effects as a result of accidents and malfunctions.</p>	<p>Malfunctions Communication Plan to ensure the appropriate communication systems are in place to inform Aboriginal Groups, communities and other users of the area in the event of an accident such as tailings breach.</p> <p>Condition 18 would require AuRico to develop an Accidents and Malfunctions Administration Plan, which would include requirements for mitigation measures of failure modes of low environmental risk and management of the risk of, monitoring and reporting on accidents along the ORAR.</p>
Effects of the Environment on the KUG Project (s. 8)	<p>Environmental effects and processes have the potential to affect the KUG Project and result in effects to VCs including: climate change, avalanches, landslides, natural seismic and volcanic activity; and lightning and forest fires.</p> <p>KUG Project design and mitigation would lower the likelihood and reduce the severity of effects of the environment on the KUG Project. Considering the implementation of the EMPs and associated plans that are requirements under the MA and the EMA, the EAO is</p>	None

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	satisfied that effects of the environment on the KUG Project are not significant.	
<p>Effects of Changes to the Environment on Aboriginal Peoples Related to CEAA 5(1)(c) (s. 10.3)</p> <ul style="list-style-type: none"> <li>• Effects On The Health And Socio-Economic Conditions Of Aboriginal Peoples Related To CEAA 2012 5(1)(c)(i)</li> <li>• Effects on Aboriginal Peoples' Physical and Cultural Heritage, and Effects on Historical, Archaeological, Paleontological or Architectural Sites or Structures Related to CEAA 2012 5(1)(c)(ii) and (iv)</li> <li>• Effects on Aboriginal Peoples' Current Use of Lands and</li> </ul>	<p>The EAO predicts that the KUG Project could cause residual effects to Aboriginal peoples through changes to the environment. The following impacts are predicted:</p> <ul style="list-style-type: none"> <li>• Quality of experience of using the land base for Current Use of Lands and Resources for Traditional Purposes (CULRTP), including cultural areas due to potentially increased human presence in the overall KUG Project region from improved access along the ORAR (due to maintenance and winter clearing);</li> <li>• Perception of country food contamination, which could affect country food consumption and Aboriginal peoples' health and family expenditures through relying on less healthy and more expensive store bought food;</li> <li>• Changes to the availability of plants, wildlife and fish; and</li> <li>• Access restrictions, which would reduce the area of land available for Aboriginal groups to conduct land based activities.</li> </ul> <p>Considering the human health risk assessment, which does not predict any residual effects to human health from the KUG Project, proposed EAC conditions to reduce the perceptions of impacts to country foods, and</p>	<p>All conditions related to water quality, fish, wildlife and plants as identified above.</p> <p>Condition 11 would require AuRico to provide training and employment opportunities for individuals from TKN to conduct monitoring at the KUG Project.</p> <p>Condition 19 would require AuRico to ensure that Se concentrations of the discharge to Waste Rock Creek from the KUG Project TSF during post-closure would not incrementally increase Se concentrations in Waste Rock Creek.</p> <p>Condition 12 would require AuRico to establish an Environmental Monitoring Committee with participation from TKN and government agencies to discuss the ongoing development of the KUG Project and mitigation measures in a coordinated and collaborative manner. Issues to be discussed in this committee would include water management and treatment, the KUG Project TSF, water quality monitoring</p>

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<p>Resources for Traditional Purposes Related to CEAA 2012 5(1)(c)(iii)</p>	<p>the Economic and Community Development Agreement being negotiated between TKN and the Province, the EAO concludes that the predicted residual and cumulative effects to the health and socio-economic conditions of Aboriginal peoples would not be significant.</p> <p>Considering the EAO's prediction of only one low magnitude residual effect to the quality of experience of cultural places, and with the implementation of key mitigation measures identified by the EAO, the EAO is satisfied that the KUG Project would not likely have significant adverse residual or cumulative environmental effects on physical or cultural sites (including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance to Aboriginal peoples).</p> <p>In consideration of the non-significant impacts to fish and aquatic habitat, wildlife, caribou and harvestable plants, the likely low magnitude of effects of increased human presence (due to the distance from Mackenzie) and the proposed EAC conditions to mitigate impacts to the perception of contamination and to protect fish and wildlife, the EAO concludes that the KUG Project would not have significant residual or cumulative effects on CULRTP with respect to fishing, hunting or gathering.</p>	<p>and wildlife management and monitoring.</p> <p>Condition 31 would require AuRico to consult with TKN to identify opportunities for cultural awareness and recognition such as holding ceremonies, recognizing cultural heritage and providing cultural awareness training to KUG Project personnel.</p>