



Environmental
Assessment Office

EAO's Assessment of an Application for Certificate Amendment

Brucejack Gold Mine Project
EA Certificate #M15-01

Requested by:
Pretium Resources Inc.

November 15, 2018

Pursuant to Section 19 of the Environmental Assessment Act, S.B.C. 2002, c.43



1. OVERVIEW OF PROPOSED AMENDMENT

On March 26, 2015, Pretium Resources Inc. (Pretivm) was issued Environmental Assessment Certificate #M15-01 (EAC) under the BC *Environmental Assessment Act* (Act) and on July 22, 2015, was issued *Mines Act* (MA) Permit #M-243 for the Brucejack Gold Mine Project (Brucejack), which is an underground gold and silver mine, located approximately 65 kilometers northwest of Stewart and within the asserted traditional territory of Tsetsaut/Skii km Lax Ha (TSKLH). A portion of the access road is located within the asserted traditional territory of the Tahltan Nation, and the transmission line and the access road overlap the Nass Area as defined under the Nisga'a Nation Final Agreement. The federal Minister of Environment issued a federal Environmental Assessment Decision on July 30, 2015 that Brucejack was "not likely to cause significant adverse environmental effects referred to in subsection 5(1) of the *Canadian Environmental Assessment Act*, 2012."

Since the issuance of the EAC, Pretivm has identified a number of design revisions resulting in variances between Schedule A (the Certified Project Description [CPD]) of the EAC, the MA and other permitted facilities, areas of disturbance, and site layouts. These design changes have resulted in four EAC amendments to date:

1. The first amendment, granted on March 10, 2016, addressed the redesign of an existing non-potentially acid generating (NPAG) rock quarry and temporary storage, on surface, of potentially acid generating (PAG) rock;
2. The second amendment, granted on August 12, 2016, addressed a number of changes to infrastructure that had received applicable permits, and were in non-conformance with the EAC, therefore requiring an EAC amendment;
3. The third amendment, granted on November 23, 2016, addressed the addition of two aircraft obstruction beacons; and
4. The fourth amendment, granted on March 31, 2017, addressed an extension to the amount of time that PAG waste rock could be stored at surface, rather than under water, from six months to two years.

On April 11, 2018, Pretivm submitted an application to the Environmental Assessment Office (EAO) to amend the EAC requesting updates to the CPD to accommodate proposed changes to project activities. Specifically, Pretivm is seeking the following changes to the EAC:

1. An increase in maximum production from 16.5 million tonnes (Mt) to 18.5 Mt over the life of the mine;
2. An increase in ore production rate from an annual average of 990,000 tonnes (2,700 tonnes per day [tpd]) to 1,387,000 tonnes (3,800 tpd), which would result in a reduced mine life from 18 to 14 years;
3. An increase in the maximum monthly withdrawal volume from Brucejack Lake to 52,080 cubic metres per month from December to April (that is, low flow months) to achieve a withdrawal rate

of 70 cubic metres per hour required to support the proposed increase in the ore production rate; and

4. Use of a snow melter as an alternative to stockpiling snow cleared to maintain safe operations during winter months given the relatively confined area of the mine site.

The proposed changes also require an amendment to MA Permit #M-243 to allow for the increase in the rate of ore production, which in turn will increase the discharge rate of waste rock and tailings to Brucejack Lake beyond what is currently authorized under *Environmental Management Act* (EMA) Effluent Permit 107835, thereby also requiring an amendment. In addition to subaqueous deposition in Brucejack Lake, Pretivm is also proposing to deposit waste rock and tailings in the underground mine by backfilling underground voids.

Refer to Figure 1 for the Brucejack mine site infrastructure, including the water intake from Brucejack Lake and the approximate location of the snow melter.

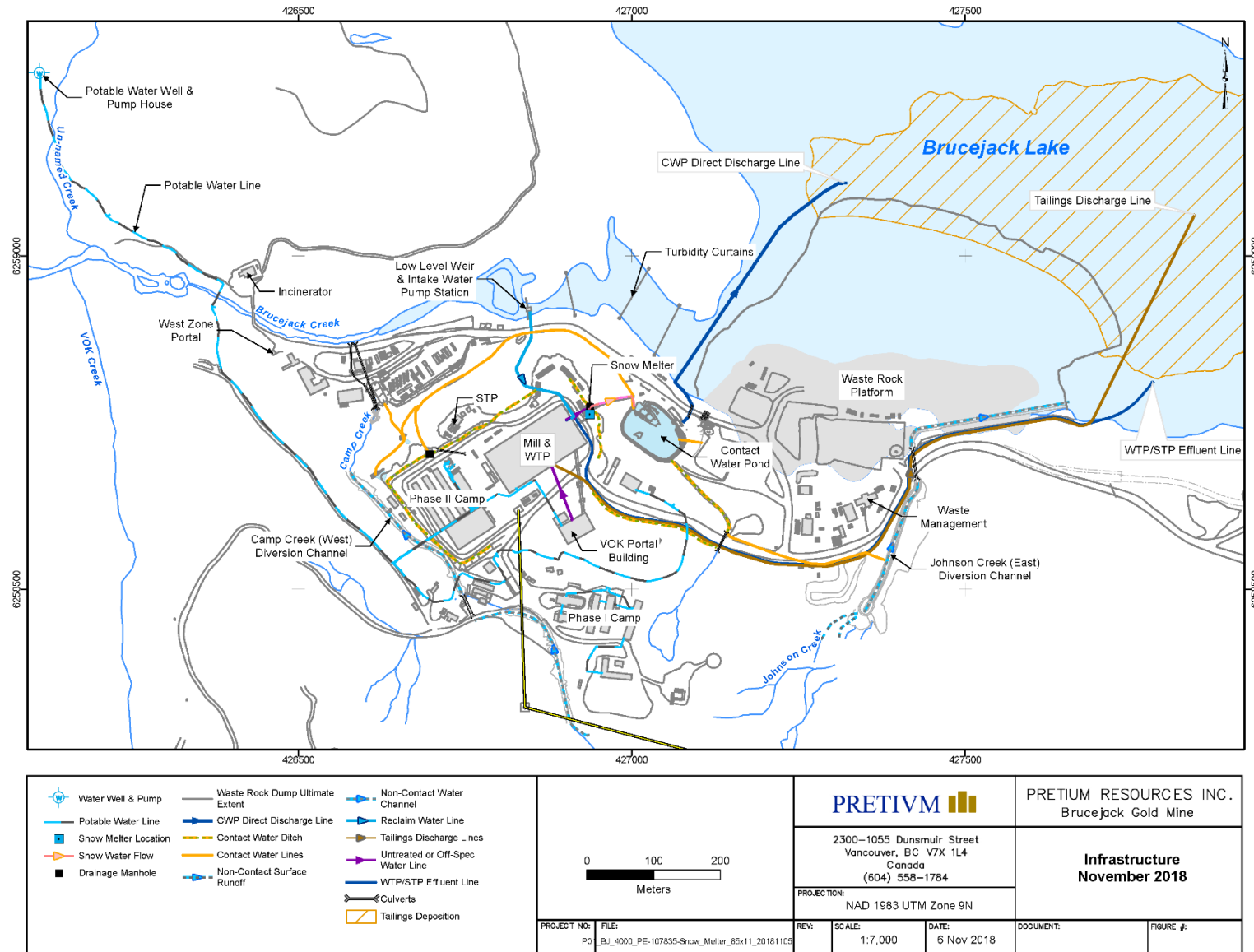


Figure 1. Brucejack Mine Site Infrastructure

2. AMENDMENT REVIEW PROCESS

Pretivm submitted a memorandum to the EAO on December 20, 2017 to support their view that the proposed changes are not material and would not warrant an EAC amendment. On January 8, 2018, the EAO communicated to Pretivm, the Major Mines Permitting Office (MMPO) and the Ministry of Energy, Mines, and Petroleum Resources (EMPR) its view that the changes requested by Pretivm may be considered material.

The EAO received an Application for an EAC Amendment (Application) on April 11, 2018. The EAO initiated contact with the Working Group, including First Nations, to assist with the review of the Application. The Working Group was comprised of representatives from TSKLH, Nisga'a Lisims Government (NLG), Tahltan Nation, EMPR, MMPO, Ministry of Environment and Climate Change Strategy (ENV), Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD), the Northern Health Authority and the Alaska Department of Natural Resources.

The review of the Application occurred concurrently with the review of the Amendment Application for the MA Permit #M-243 and EMA Effluent Permit 107835 to coordinate with reviewers on the Mine Development Review Committee (MDRC) that acted as reviewers on the Working Group for the Application.

The Working Group was given over five weeks to review and comment on the Application from early-May 2018 to mid-June 2018, after which Pretivm provided responses. The Issues Tracking Table is available on the EAO's website¹, which includes comments on both the Application and the Amendment Application for MA Permit #M-243 and EMA Effluent Permit 107835.

Potential impacts on Aboriginal Interests (asserted or established Aboriginal rights, including title and Treaty rights) was viewed as low to moderate. The EAO's preliminary view was that the proposed amendment was unlikely to change the magnitude of the residual effects predicted in the EA review as the changes proposed are within the assessment footprint used during the EA review.

It was determined that public consultation was not required based on the preliminary view that there would likely be a low likelihood of impact resulting from the proposed changes and that there was a low level of public interest in Brucejack during the EA review.

A draft of this Assessment Report was provided to the Working Group on September 21, 2018. ENV provided comments regarding surface water quality and confirmed their opinion that the proposed increase in concentrations of antimony, ammonia and arsenic associated with the increase in production will not negatively affect the aquatic resources in Brucejack Creek and the environment downstream (see Section 3 of this Assessment Report). NLG noted ongoing concerns regarding the Brucejack access road, which are summarized in Sections 3 and 4 of this Assessment Report. The EAO did not receive any other comments or concerns from the Working Group.

¹ <https://projects.eao.gov.bc.ca/p/brucejack-gold-mine/docs?folder=147>

3. SUMMARY OF ISSUES AND EFFECTS

The Application was reviewed by the Working Group for issues and potential effects. Key issues raised by the Working Group on the Application are summarized below. All Working Group comments are listed in the Issues Tracking Table available on the EAO's website with the exception of Tahltan Nation's comments, which are summarized below. The Issues Tracking Table includes comments made on the Application, as well as the Amendment Application for MA Permit #M-243 and EMA Effluent Permit 107835.

AIR QUALITY

In their review of the Application, the Northern Health Authority inquired if the snow melter would reduce snow pack to a level that would cause an increase in drying and therefore increased dust effects.

In response, Pretivm noted that the snow melter is being proposed to melt quantities of snow which would otherwise be stockpiled. The snow cleared for use in the snow melter would occupy a small surface area and would have a negligible effect on the drying of the surface and related dust effects. Accordingly, the snow pack would not be reduced as a result.

The Northern Health Authority requested rationale from Pretivm for concluding that no updates to the Air Quality Management Plan would be required due to the proposed amendment.

Pretivm responded that since no additional air quality effects were identified and no new mitigation measures proposed, no changes to the Air Quality Management Plan would be required.

The Northern Health Authority was satisfied with Pretivm's responses.

SURFACE WATER QUALITY

Tahltan Nation noted that there are surface water parameters that exceed monthly and maximum guidelines. In its Application, Pretivm indicated that there are limited potential effects related to these exceedances as the receiving environment in Brucejack Lake and Brucejack Creek has low aquatic life value and is not fish-bearing. Tahltan Nation expressed concern that Pretivm did not provide adequate rationale for the allowance of these exceedances regardless of the status of the receiving environment.

ENV reviewed the proposed increase in ore production and resulting increase in tailings and waste rock discharge rates to Brucejack Lake. The proposed increases in tailings and waste rock are predicted to increase the concentrations of antimony, ammonia and arsenic in the water discharged from Brucejack Lake to Brucejack Creek. As a result, Pretivm requested an increase to the discharge concentrations for the three contaminants at Brucejack's regulated discharge location at BJ3.10. The rationale provided by Pretivm in the Application and supplementary information support the requested amendment and indicates a low potential for impacts to aquatic life or other users in the downstream receiving environment. Pretivm addressed all of ENV's concerns during the review process which included undertaking additional toxicity testing to support their request. ENV is of the opinion that the proposed increases in concentrations of antimony, ammonia and arsenic will not negatively affect the aquatic resources in Brucejack Creek

and the environment downstream. ENV noted that monitoring requirements currently in place, in addition to a new chronic toxicity testing requirement proposed, should provide site-specific verification of the impact assessment.

GROUNDWATER QUALITY AND QUANTITY

The EAO and Tahltan Nation requested further rationale for the exclusion of groundwater quantity and quality from the assessment in the Application. Following review of the Amendment Application for MA Permit #M-243 and EMA Effluent Permit 107835, EMPR requested the estimated total increase (or decrease) in groundwater inflows due to the increased underground workings associated with the proposed changes.

Pretivm responded that the vertical extent of underground mine workings remains unchanged, while the lateral extent changes by approximately one hectare. The change in underground workings is considered to result in a negligible change in predicted total groundwater inflow rate into the mine and the groundwater cone of depression.

Pretivm also noted they are in the process of installing a groundwater well program, and will be updating the groundwater flow model for Brucejack as part of the five year mine plan update, which is a requirement of MA Permit #M-243. At that time, a more robust data set will be available for evaluation of the preliminary groundwater flow models. These responses were considered acceptable to EMPR. ENV also assessed the proposed groundwater well configuration and found it to be robust. The proposed changes being requested were thus reviewed for groundwater implications by provincial regulators. It is acknowledged that additional work related to groundwater is required, including the expansion and continued monitoring of the groundwater well network, which will factor into Pretivm's mine plan update.

ARCHAEOLOGY

Tahltan Nation referenced recent archaeology studies conducted on the Iskut Extension Transmission Line, which included pre- and post-disturbance surveys. The post-disturbance surveys documented significant Tahltan Nation artifacts. Accordingly, Tahltan Nation recommended post-disturbance archaeological surveys be included as a condition of the EAC and permitting.

The EAO and EMPR responded that the proposed changes do not require any additional above-ground disturbance to occur on or offsite. The increase in production is restricted to the underground workings and subaqueous waste dump. It should be noted, however, that the Heritage Management Plan for Brucejack includes mitigation for as-yet unknown archaeological sites including a Chance Find Procedure should archaeological sites be encountered.

TERRAIN STABILITY

The EAO requested further rationale for the exclusion of terrain stability from the assessment in the Application.

Pretivm responded that the proposed changes are not anticipated to change conclusions regarding Brucejack's potential effects on surface subsidence, the likelihood of which remains very low due to backfilling of tailings and waste rock into underground voids. EMPR provided comments on geotechnical considerations in the underground due to the increase in production and was satisfied with the proposed changes given Pretivm's intention to backfill with paste tailings and/or waste rock.

ECONOMIC ACTIVITY

The EAO inquired as to potential adverse effects on economic activity due to the proposed decrease in mine life from 18 to 14 years.

Pretivm responded that the increased annual production rate will result in an additional 12 full-time equivalent positions, which would offset the reduced years of employment resulting from the reduced mine life. Pretivm also noted that the increase in total production to 18.5 Mt would result in higher Mineral Tax revenue to government annually over a period of 14 years from 18 years. First Nations with Mineral Tax revenue sharing agreements with the Province would also see an increase in overall revenue from Brucejack.

ROAD USE

In February 2018, NLG expressed concerns regarding potential increases in vehicle traffic on the access road due to the proposed increase in production. NLG noted that an increase in traffic could lead to increased sedimentation and waste discharges from vehicles into Knipple Glacier and other water bodies. During the amendment review, the EAO inquired if there are any changes to potential effects due to the proposed amendment resulting from the addition of the one 30 tonne haul truck noted in the Application.

Pretivm responded that during the EA review of Brucejack at a production rate of 2,700 tpd, ore concentrate shipments were estimated at an average of six trucks per day to a maximum of 10 trucks per day on a seven day per week schedule. The current practice at Brucejack is nine concentrate trucks per day on a reduced five day per week schedule. Tonnage per truck load is currently less than the original forecast, which will be alleviated using specialized shipping containers in fall 2018. The use of these containers and a return to a seven day per week shipping schedule is anticipated to require eight or nine concentrate truck loads per day for the 3,800 tpd production rate proposed in this amendment. This estimate remains within the maximum of 10 trucks per day assessed during the EA and therefore no change in potential effects due to an additional truck was anticipated.

The EAO is satisfied that the conditions of the EAC adequately identify and mitigate the potential adverse environmental, economic, social, heritage, and health effects of the Project resulting from the proposed amendment. The EAO also notes that Pretivm is proposing updates to the Metal Leaching/Acid Rock Drainage Management Plan, Nitrogen Management Plan, as well as the Operations, Maintenance and Surveillance Manuals for Mine Site Surface Water Management Facilities and Subaqueous Waste Rock and Tailings Deposition Management following issuance of the amended permits.

4. FIRST NATIONS CONSULTATION

First Nations potentially affected by the proposed changes to the EAC are TSKLH, NLG and the Tahltan Nation. All three First Nations were invited to provide comments on the proposed EAC amendment.

Consultation with First Nations was conducted jointly between EAO and EMPR with support from FLNRORD. TSKLH, NLG and the Tahltan Nation were notified through their representatives on the Working Group.

In response to an email from FNLROD regarding the initiation of the review of the Amendment Application for the MA Permit #M-243 and EMA Effluent Permit 107835, TSKLH expressed their view that the Province has not conducted adequate consultation and that they would not be able to participate in the EAC or permit amendment reviews as they have not been properly engaged. FLNRORD and EMPR responded that the Province has taken the approach of engaging TSKLH as members of the MDRC/Working Group for the proposed changes, which is intended to reflect consultation on the deep end of the spectrum by providing the opportunity to comment throughout the amendment review process. It was further noted that TSKLH would have the opportunity to comment on draft documents prior to a decision for the EAC and permit amendments.

In September 2018, NLG emphasized their ongoing concerns regarding the Brucejack access road including the initial permitting that occurred during exploration activities, scoping of the access road during the EA review, and the uncertainty of potential effects on water quality. In response to NLG's concerns, Pretivm provided a memorandum, which is available on the EAO's website.² The memorandum described the following:

- A timeline of the permitting related to Brucejack exploration activities that began in 2009;
- The access road impact assessment that was completed by Pretivm in 2015 in response to NLG's concerns regarding the exclusion of the access road during the EA review; and
- Ongoing water quality monitoring of sediments and hydrocarbons at Knipple Glacier and Knipple Creek.

On October 25, 2018, the EAO provided an updated version of this Assessment Report to NLG that described their concerns regarding the access road. NLG responded that they had no further comment on this Assessment Report.

The Tahltan Central Government on behalf of Tahltan Nation submitted review comments to the EAO and EMPR. These comments are summarized in Section 3 of this Assessment Report.

² <https://projects.eao.gov.bc.ca/p/brucejack-gold-mine/docs?folder=147>

5. CONCLUSIONS

Based on:

- The information contained in the Application and the Amendment Application for the MA Permit #M-243 and EMA Effluent Permit 107835;
- The Working Group's comments on the Application and the Amendment Application for the MA Permit #M-243 and EMA Effluent Permit 107835, and Pretivm's responses to those comments;
- Direct engagement by Pretivm with members of the Working Group;
- Consultation with First Nations; and
- Pretivm's proposed changes to the CPD of the EAC.

The EAO is satisfied that:

- The amendment assessment process has adequately assessed the requested changes to the EAC, and the potential for adverse environmental, economic, social, heritage and health effects from those changes;
- The existing conditions in the EAC, which include various management plans, are expected to mitigate the incremental adverse effects such that residual adverse effects beyond what were assessed during the EA are not expected and no significant adverse effects are predicted or expected from this amendment;
- The potential for adverse effects on the asserted or established Aboriginal rights, including title and Treaty rights of First Nations has been avoided, minimized or otherwise accommodated to an acceptable level; and
- The provincial Crown has fulfilled its obligations for consultation and accommodation to First Nations relating to the issuance of an amendment to the EAC.

The EAO recommends that the EAC be amended under Section 19 of the Act to allow the requested changes to the CPD.