Sent to BC EAO
By email: eao.EskayCreekRevitalization@gov.bc.ca

Impact Assessment Agency
By email: eskaycreek@iaac-aeic.gc.ca

Tahltan Land & Regulatory Affairs
By email: landsdirector@tahltan.org

September 24, 2025

Re: *Comments on Eskay Creek Revitalization project – Effects Assessment and Recommendation phase*

To Whom It May Concern:

Northern Confluence is an initiative based out of Smithers that advocates for more sustainable land-use in northern B.C., including mining development. We appreciate the opportunity to submit comments on the Eskay Creek Mine Revitalization Draft Assessment Report and Draft Conditions.

As part of our review, we commissioned Dr. Rina Freed and Martin Shin of Source Environmental Associates Inc. to review the proponent's responses to concerns raised on the draft application, in particular as it relates to water quality, water treatment needs and water closure plans. We also commissioned Dr. David Chambers from the Centre for Science in Public Participation to assess gaps and review the mine waste and tailings management, and analysis of reclamation and closure in the revised application and conditions. These reviews and comments on the revised Eskay Creek Revitalization EAC application and Draft Assessment report are attached. These were accepted as given. A number of concerns are raised that we hope are addressed by Skeena Resources and the regulator.

Other questions and considerations as part of the review:

1. ***Tracking economic benefits***

Mining is an extractive industry that produces a lot of waste and pollutes water. Often, the BC Environmental Assessment Office will recommend approval of mines despite environmental impacts due to the proponent's alleged promises of economic benefits – namely tax revenue and job creation. In the Draft Assessment report, it is noted that, among other things:

> "ECRP would increase employment opportunities, with emphasis on inclusive hiring practices to reflect local demographics…Project construction is anticipated to last 2 years and directly employ up to 949 person years. Operations will last 13 years and employ up to 771 person years during peak operations. Skeena also intends to involve local suppliers, generating indirect and induced economic benefits as wages are reinvested within the community…ECRP would also generate tax revenue for the province, through personal income taxes, Provincial Sales Tax, corporate income tax and the BC Minerals Tax Skeena estimated that ECRP would generate approximately $60.3 million during Construction, $1,193.4 million during Operations, and $-3.6 million during Reclamation and Closure phases in provincial tax revenues. … Skeena plans to prioritize local hiring and skills training, particularly for underrepresented groups." (Draft Assessment Report 10.3, pp 54-55).

The Draft Assessment (s 17.12.6 (p 245)) raises some concerns that these regional employment commitments may fall short: "*the proponent's estimate that local workers (including Tahltan members) will make up 25 percent of the total worker force —is lower than what has been achieved in comparable projects in the region*." We also know from the UBC/SFU study on economic benefits of mines, that mines often underperform and result in fewer jobs and tax revenues than stated in Environmental Assessments (and an acknowledgement that data is often lacking).

We strongly support EAO's drafted Condition 23: Socioeconomic Management Plan with the details required on B17-18 with additions: We think it's important to extend beyond the first five years of Operations to annual reporting for the duration of Eskay Creek's operations; to add actual tax revenue to the province and federally to this reporting to measure real vs. promised benefits; and ensure that the labour reporting (number of people working, identity factors, such as gender and ethnicity; and home location of workers) is publicly available.

Until the province starts to track all proponent promises in Environmental Assessments to actuals, and have conditions that hold companies to account (with some flexibility for market conditions), there is actually no proof for statements such as that from the EAO concluding on page 276 (20.4) that: "*After considering proposed mitigation measures and Certificate conditions, the EAO concludes that ECRP would have overall positive effects on local employment and the economy associated with the development of ECRP for current and future generations.*"

2. Reclamation plan and adequate bonding

In the Draft Assessment report under s 17.6.5 Mitigation measures (and repeated in Tahltan Risk Assessment, page 127):

> "Not all ECRP activities would cease when mine production ends, not all facilities would be decommissioned, and not all sites would be reclaimed. Post-mine production, operations associated with active water treatment and management would continue, followed by an indeterminate period where both active and passive water treatment operations would be required. The TMSF is a permanent structure that must remain stable and function effectively *in perpetuity*, which will require some degree on ongoing monitoring and maintenance."

There are a number of questions that remain with regards to the reclamation/restoration plans, and associated costs. While the EAO responded to Tahltan concerns with Condition 26: End Land Use Plan (s.17.6.6.2), it does not appear to entirely meet the need for ensuring adequate financial assurances and ensuring consent requirements throughout the life of the mine.

In the Tahltan Risk Assessment (page 148), the following are suggestions for mitigation measures to address Tahltan concerns: "*Ensuring the projects bond is sufficient for restoring the land and waters to a healthy state to support current and future generations use and connection to the land and waters*." And: *"A fully costed closure estimate being provided as part of the EA process to support the Tahltan decision. This cost estimate includes water treatment capital and operating costs and sludge management costs for 7-generations, post closure*." We would recommend these being conditions or added as requirements under Condition 26 for the EA certificate.

Lastly (if not included in the Tahltan conditions), the EAO should support that consent from the Tahltan be required throughout the mine life – including during reclamation and closure to ensure conditions of the Tahltan and alignment with their Sustainability Requirements are met.

3. *Fish and fish habitat* data gaps

As DFO noted in the draft Application, and still apparent in the revised Application, there is a lack of sufficient baseline data on fish and fish habitat in the lower 200 kms of Ketchum Creek. While a helicopter survey was done by Skeena, there are real data gaps in terms of multi-year fish studies for coho, chinook and other potential resident fish, like Dolly Varden. Instead of requiring these be addressed pre-certificate despite not having a full understanding of fish and impacts to habitat, Eskay Creek will be required (s. 17.5.6.4) to apply for a HADD provision under the *Fisheries Act* given likely death of fish from low flows in late winter and early spring while in operations. In addition, "*in consideration of the concerns ECCC, TCG and DFO, the EAO has proposed Condition 17: Aquatic Effects Monitoring Plan, which includes a requirement to monitor effects to aquatic resources and identify deviations from effects predicted in the Revised Application. The EAO has recommended follow-up programs to IAAC for monitoring the surface water flows and levels in Ketchum Creek and implement modified or additional mitigations if an*

increase in adverse effects to fish and fish habitat are identified. Also, in consideration that DFO is requiring a Fisheries Act Authorization of lower Ketchum Creek, the EAO is satisfied that this has been adequately addressed for the purposes of the ECRP assessment" (Draft Assessment page 181).

It is unclear how the EAO can be satisfied given the proponent's lack of willingness to access Ketchum Creek to conduct baseline data and develop adequate mitigation measures prior to impacts being monitored. The Revised EA Application and draft Assessment Report continue to have gaps in data and analysis for this important value component, and instead seem to be relying on DFO authorizations and monitoring damage as incorporated into draft Conditions 17 and 18. Given the uncertainties from data gaps and the critical salmon habitat of the Unuk watershed, it seems unreasonable for the EAO to conclude that the impacts to fish and fish habitat from the project will be "not significant".

Lastly, it is unclear how the lack of data and post-management strategies are to meet the Tahltan Stewardship Plan Management Directions for the Unuk River as articulated in the Tahltan Assessment report (pages 62-65 – river corridors), including to: "Maintain healthy salmon ecosystems and all ground and surface water sources that drain into the river"; and "Protect all groundwater and surface water sources and ensure clean pristine water for all living beings and communities".

4. Effects on future generations

As per comments sent on the draft application, there is no assessment of cumulative effects or impacts of a provincial decision to support another gold (and silver) mine in B.C., neither of which are listed as "critical minerals". Despite the federal substitution requirement to assess "h) the extent to which the designated project contributes to sustainability" and Appendix 9 – "Effects on Current and Future generations", there is nothing on how this gold/silver mine impedes future mine developments in the region for minerals more needed for the transition and future generations (such as nickel, copper, rare earths). How does it harm other opportunities and needs of current and future generations to switch off fossil fuels? How does it align with the Tahltan Stewardship Plan which may include parameters around limits and scope of number of mining projects at one time? How does it reconcile with provincial and federal "critical minerals' strategies" given cumulative impacts of several gold mines, existing and proposed mines in the region, and climate targets that are not being met. In the revised application (April 2025), under 36-22, ECRP concludes: "*Negative residual effects are largely confined to the Project mine site and the current generation*." While there are commitments to on-going engagement by ECRP in cumulative effects assessments in the region, there is little

context and analysis being done within the push for “critical minerals”. The EAO should develop a policy to better weigh the benefits/risks of mining for non-critical minerals vs. transition minerals within the EA process, and the impacts on future generations.

Overall, it is noted in several places in the application that there are higher risks to “overall project viability and environmental protection” (eg. page 180 – s. 17.5.6.2) than what is outlined in the Application. We hope to see some of the gaps and risks addressed that we outline above and in the two appendices referenced above (from Source and CSP2).

The following documents are Referenced above and accessed from - https://engage.eao.gov.bc.ca/EskayCreek-EA:

Draft Assessment Report for the Eskay Creek Revitalization Project – August 2025
Tahltan Risk Assessment – Draft version 1.0 – August 2025
Draft Federal Conditions – English
Schedule B – Table of Conditions for the Eskay Creek Revitalization Project

Thank-you,

Nikki Skuce, Director
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"Technical Support for Grassroots Public Interest Groups"

September 19, 2025

To: BC EPIC **Project Assessment Team**
EAO.operations@gov.bc.ca

Re: Comments on 2025 Eskay Creek Effects Assessment

General Observations

From a waste management and water quality standpoint, the Eskay Creek Revitalization Project poses a number of different risks than did the original Eskay Creek Mine. For most of its operating history, the original Eskay Creek was an underground mine that shipped its ore offsite for processing, and backfilled the waste rock created into the underground mine workings. At the end of its mine life, ore was processed onsite and tailings were produced. Waste was then disposed in Albino Lake, one of the first mines authorized by Schedule 2 of the Fisheries Act to use lakes for mine waste disposal.

The Eskay Creek Revitalization Project will use open pit mining, which creates significantly more waste rock than from an underground mine. The ore will also be processed on site. As a result, 40 million tons of tailings, and 160 million tons of potentially acid-generating waste rock, will be disposed behind two large tailings dams, the tallest approximately 95 meters in height. The closure plan is to keep this acid-generating material saturated with water, minimizing the rate at which acid mine drainage contaminants will be produced from the waste. The downside to this closure approach is that because the waste is saturated, if there is a catastrophic dam failure (a low-probability but high-consequence event), the waste is highly mobile and will cause maximum damage as it flows like a viscous liquid downstream.

In addition to the tailings and acid-generating waste rock, 140 million tons of non-acid-generating waste rock will be placed in a separate disposal facility. Even though this waste rock is classified as non-acid-generating, it can still leach contaminants. At Eskay Creek, the metallic neutral-leaching contaminants are likely to be antimony, iron, zinc, and potentially others. Sulfate and total dissolved solids will also likely be high.

Most hardrock mines are located in areas that are mostly volcanic rocks, which forms relatively impermeable bedrock on which to place waste disposal facilities. However, the bedrock for the waste disposal facilities at the Eskay Creek Revitalization Project is sediments, which are more conducive to groundwater flow. In addition, the faults in this area are highly transmissive, and will act as conduits for the flow of seepage water from the waste impoundments.

All of this means that unlike the original Eskay Creek Mine, where contaminating groundwater was not a major consideration, taking precautions to prevent the migration of seepage from both waste disposal facilities to adjacent streams through groundwater should be an important consideration. This issue is not given the level of discussion it deserves in the project documents, implying that it may also have not received an appropriate level of consideration in the project review either.

DOCUMENT-SPECIFIC COMMENTS

A. Tom Mackay Storage Facility (TMSF) Liner, and Bedrock permeability & potential seepage

The water quality in the TMSF will be poor, and is projected to remain so after project closure. The short distance between the TMSF and the upper Tom Mckay Creek drainage will make it difficult, if not impossible, to intercept any seepage from the TMSF into this drainage. As a result, a full bottom liner for the TMSF should be given serious consideration. There is no discussion in the documents of the benefits, and costs of, a liner for the TMSF.

There is brief mention of a liner and underdrain on the faces of the dams, but these liners are meant merely to keep water out of the dams to preserve structural stability. Dam face liners and underdrains are not designed to address tailings seepage to groundwater. A liner will only be effective at protecting groundwater only if it covers the entire bottom of the tailings facility.

Of concern is the presence of numerous fault zones under the TMSF (Skeena 2025, Appendix 01-4D). Knight Piesold noted, "… *In situ hydraulic conductivity test, supported by instrumentation monitoring, indicates that the fault structures act as the primary groundwater conduits.* …" (Skeena 2025, Appendix 1-3).

These faults could become major pathways for seepage to discharge to both groundwater and/or to the Tom Mckay Creek watershed. Knight Piesold noted, "*The magnitude of seepage is highly sensitive to increased fault conductivity*." (Skeena 2025, Appendix 1-3).

There are also several problematic statements regarding the permeability of the bedrock below the TMSF. Knight Piesold, Skeena Resources' consultant on this issue, cautions; "*Unrecoverable seepage is not captured by the seepage collection system and has the potential to negatively impact the environment. Unrecoverable seepage at the North and South Dam would occur via deeper flows which bypasses the foundation drains.*" (Skeena 2025, Appendix 1-3).

In addition, artesian conditions have been observed in the vicinity of the sites for both the North and South dams. This suggests that groundwater levels might be fluctuating over the course of the year, which would facilitate exchange between the tailings and underlying bedrock.

In comments submitted during the previous round of comments, I pointed out that there was no discussion in the documents of a liner for the TMSF. Skeena Resources responded:

> "*The reviewer asserts that there is "no discussion in the documents of a liner for the TMSF". The design of the TMSF does include discussion on liners at the TMSF, and includes a double-liner system, consisting of a geomembrane liner overlying a geosynthetic clay liner (GCL), to be* ***installed on the upstream face of both the North and South Dams****, and anchored into intact bedrock to create a low-permeability seal between the liner and foundation materials of the TMSF*." (***emphasis added***)

As previously mentioned, liners and underdrains placed on the face of a dam is meant merely to keep water out of the dam to preserve structural stability. Dam face liners and underdrains are not designed to address tailings seepage to groundwater. A liner will only be effective at protecting groundwater only if it covers the entire bottom of the tailings facility, which is not the way the way the liner is being described by Skeena Resources (see ***emphasis*** in the paragraph above). The question about whether a liner for the tailings facility is needed is both straightforward and simple, and it appears that Skeena does not want to engage in a discussion about a liner for the tailings facility.

In the most recent Draft Assessment Report, Metal Leaching and Acid Rock Drainage Management Plan (Skeena 2025, Appendix A-1A), it is stated that:

> "*Mitigation strategies triggered by seepage water quality results are enacted to prevent impacts to the receiving environment from the Construction Stockpile, fill areas, MRSA, Upper and Lower PAG stockpiles, TMSF, and ASF. Should seepage sample water quality reach the trigger level(s) as discussed above in Section 6.3.3.2 and defined in Table 6-1, the following are proposed mitigations strategies:*
>
> - *Covering of the stockpile that has reached a trigger level with linear low-density polyethylene (LLDPE) or high density polyethylene (HDPE) to prevent further infiltration; or*
> - ***Rehandling of material and subaqueous placement in the TMSF." (emphasis added)***

If seepage from the TMSF is the problem, it is not clear how the proposed mitigation, "Rehandling of material and subaqueous placement in the TMSF" would reduce water quality exceedances.

The deployment of a fully-lined TMSF would avoid most of the potential issues with seepage issues from the TMSF. At present, there is no realistic mitigation proposed/discussed for seepage issues at the TMSF.

Given the potential seepage paths that are known to exist under the TMSF, more detail for mitigating potential seepage problems, for example barrier wells, needs to be determined as a part of the initial permitting process.

If seepage interception and treatment is not analyzed now, it is likely that any future TMSF seepage issue could result in merely living with the impacts, not mitigating the impacts. Seepage from the TMSF has been identified as a potential threat in the technical reports. The present project documents do not adequately evaluate feasible mitigation methods (liners, slurry walls, barrier wells, etc.) to prevent potential seepage issues from the TMSF.

B. Stability Requirements for the Mine Rock Storage Area

In order to meet Global Industry Standard on Tailings Management requirements, the design earthquake for the tailings dams is the 1 in 10,000-year event. Like the tailings dams, the Mine Rock Storage Area (MRSA) will need to maintain its integrity in perpetuity, or the waste rock will likely end up in Tom Mackay Creek. The design earthquake for the MRSA is the 1 in 475-year seismic event, which puts the MRSA at risk of failure during a large seismic event, perhaps not in our lifetime, but within the reasonably foreseeable future.

The MRSA has been rated by Knight Piesold in its Waste Dumps and Stockpiles Detailed Design Report as having "Moderate" Stockpile Stability Acceptance Criteria for Consequence and Confidence (Skeena 2025, Appendix 1-5, Table 2.3), and then determined this leads to a seismic design seismic event of 1 in 475-years (Skeena 2025, Appendix 1-5, p. E 8 of 43).

Use of the 1 in 475-year design seismic event puts the MRSA at risk of failure during a large seismic event, perhaps not in our lifetime, but within the reasonably foreseeable future. More quantitively, a 1 in 475-year earthquake has a 65% probability of occurrence in the next 500 years. It is highly unlikely that the cost of picking up failed waste rock, and depositing it back in the MRSA, is being factored into the financial assurance calculations, even though that cost could run into the millions of dollars.

A critique of this issue was submitted during the previous round of comments. The response from Skeena Resources was:

> "*The design earthquake for the MRSA, similar to the design earthquake for the TMSF, was selected based on industry standards and guidelines for the design of waste rock dumps in BC.*"

The technical report used by Skeena consultant Knight Piesold to justify the 1 in 475-year seismic event as the design event for the MRSA, (Guidelines for Mine Waste Dump and Stockpile Design, Hawley & Cunning, editors, 2017), reportedly used the following factors in developing a rationale for determining the engineering and risk-based justification: (1) alignment with building codes; (2) risk tolerance for non-critical infrastructure; (3) balance of safety and cost; (4) historical performance; and, (5) hazard classification system. One factor to keep in mind in considering any engineering and risk-based justification, including tailings dam classifications, is that the justification is being determined by engineers on behalf of society, but society does not get to participate, or vote, in the determinative process. We have a panel of engineers, even if well-intentioned, deciding what level of risk is acceptable to civil society, without civil society being involved in the decision making process.

The failure of the waste rock dump at Eskay Creek is likely to block a stream, leading to significant additional downstream damage and water contamination. Common sense dictates that a more conservative design standard should be applied, especially in location like the Eskay Creek mine site.

The choice of the relatively low-energy 1 in 475-year seismic event as the design event for the MRSA exposes the taxpayer to unnecessary risk. It would be prudent, as for the tailings dam, to design the MRSA to withstand the 1 in 10,000-year seismic event – and probably not that costly given the low seismicity predicted for this area.

C. Financial Assurance for Reclamation and Closure

Lack of analysis for the financial assurance that would be required for the project is an issue that was raised by the Tahltan Central Government in its comments, and also raised by comments from the public. Not only is the amount of financial assurance, and the assumptions used to establish that amount, significant issues, but what items would be covered by the financial assurance is even more important. For example, is water treatment in perpetuity to be assumed? This is a critically important issue that is not being discussed, and it is a factor in determining the financial viability of the project.

At the present time, there is no discussion of the financial assurance that would be needed to pay for reclamation and closure of the mine, should the mine operator be forced into bankruptcy. A financial assurance is needed (and required in British Columbia) because reclamation and closure activities cost tens to hundreds of millions of dollars. If this money is not made available by the operator, then the public would need either to pay these costs, or suffer the consequences of environmental, social, and economic effects of an abandoned mine.

When this issue was raised during the previous round of comments, Skeena Resources response was:

> "*Skeena Resources clarifies that it will develop an RLCE* (Reclamation Liability Cost Estimate) *as part of the Major Mines Permit application as required under Section 11 of the Joint Application Information Requirements*."

Section 11 of the Joint Application Information Requirements requires:

> "*… detailed information required in an RLCE accompanying a Mines Act or a joint Mines Act/Environmental Management Act permit application …*"

Lack of information is not a reasonable reason for deferring analysis of this issue. The project proponent and the government have more than enough information, or should have, to make a reasonable estimate of the amount of the financial assurance at this stage of the project, and a reasonable estimate is all that is necessary to answer the questions raised above.

Why this is not being interpreted as requiring disclosure of the financial assurance calculations during this phase of the process, when the mine will be granted permission to proceed, is not clear.

Before a mine is approved, the public should be given an opportunity to comment on the adequacy of the calculations – i.e. have those calculations included all of the necessary elements; were current cost estimates labor, equipment, and fuel utilized; has inflation been conservatively managed in the calculations, etc.? Since the amount of financial assurance required for reclamation and closure has the potential for significant economic and environmental impact, the public should be given an opportunity to comment on the adequacy of this requirement.

Both during operation, and after closure, the quality of the water in the North Pit is projected to be poor, as well as the seepage from both the TMSF, and the MRSA. The mine area is net precipitation area, with evapotranspiration a relatively small 5% to 11% of precipitation, so water will accumulate (Skeen 2025, Appendix 1-9, Appendix B – Okane Memorandum, p. 6). Because it cannot be predicted with certainty that contamination from the waste will diminish to a point where water treatment will no longer be required, then for financial assurance purposes it must be assumed that water treatment will be needed in perpetuity. Post-closure water treatment typically doubles the cost of the financial surety.

Post-closure cost calculations must include monitoring, routine maintenance, and most importantly post-closure water treatment costs. Have reasonable assumptions been made in the water treatment cost calculations for the operating costs, the capital replacement intervals, the rate of inflation, the rate of return for trust fund monies, and the time interval over which to run the net present value calculation for the water treatment monies? These are only some of the critical assumptions and calculations on which the public should be able to comment.

Financial assurance estimates are a critical part of reclamation plan, and should be disclosed and discussed prior to permit issuance. This information is all readily available from the mining company when a formal mine proposal is submitted to a permitting agency. To wait until post-permit analysis to make and disclose this analysis (if it is made public) is merely hiding the ball. Post-permit analysis does not allow the public to weigh in on these important issues in a timely manner.

D. Draft Conditions

Many, if not most, of the conditions specified are of a generic nature, and could be applied/required of any mining project. As a result, the conditions required do not appear to reflect the result of a detailed analysis of this project, but largely reflect general regulatory guidelines. It is not clear how they will make this particular project better.

Air Quality and Fugitive Dust

Condition 6.4.3 would require the operator to; "*monitor, throughout construction and operation on an annual and short term basis including for 1-hour and 24-hour periods, ambient air concentrations of NO2, PM10 and PM2.5; …*"

The location of the monitoring stations is needed to adequately measure dust from variable weather/wind conditions, and the type of instrumentation required to provide accurate measurements of NO2, PM10 and PM2.5 should be specified in the conditions. Measurement of air impacts is still a developing science, and there are many recent examples of dust impacts being under-reported, or unreported (e.g. at the Red Dog Mine in Alaska).

Background of Reviewer

I have 45 years of experience in mineral exploration and development – 15 years of technical and management experience in the mineral exploration industry, and for the past 30+ years I have served as an advisor on the environmental effects of mining projects both nationally and internationally. I have a Professional Engineering Degree in physics from the Colorado School of Mines, a Master of Science Degree in geophysics from the University of California at Berkeley, and am a registered professional

geophysicist in California (# GP 972). I received my Ph.D. in Environmental Planning from Berkeley. My recent research focuses on tailings dam failures, and the intersection of science and technology with public policy and natural resource management.

Sincerely;

David M. Chambers, Ph.D., P. Geop

References

EAO 2025. Draft Assessment Report for the Eskay Creek Revitalization Project, British Columbia Environmental Assessment Office, August 2025

Hawley & Cunning 2017. Guidelines for Mine Waste Dump and Stockpile Design, Mark Hawley and John Cunning, editors, CSIRO Publishing, 2017

Skeena 2025. Eskay Creek Revitalization Project, Revised Application for an Environmental Assessment Certificate / Impact Statement, Skeena Resources, April 2025

Skeena 2025, Appendix A-1A. Draft Assessment Report, Metal Leaching and Acid Rock Drainage Management Plan, Lorax Environmental, April 2025

Skeena 2025, Appendix 1-3. Tom Mackay Storage Facility, Detailed Design Report for the Eskay Creek Revitalization Project, Knight Piesold Consulting, January 14, 2025

Skeena 2025, Appendix 1-4D. Geotechnical and Hydrogeological Site Investigation Reports, 2023 Geotechnical and Hydrogeological Site Investigation Report, Knight Piesold Consulting, June 6, 2024

Skeena 2025, Appendix 1-5. Waste Dumps and Stockpiles Detailed Design Report, Knight Piesold Consulting, Vancouver BC, January 14, 2025

Skeena 2025, Appendix 1-9. Eskay Creek Revitalization Project, Reclamation and Closure Plan, Okane Consultants, April 2025

Skeena 2025, Appendix 15-6. Geochemical Source Terms for the Eskay Creek Revitalization Project, SRK Consulting, April 2025

TECHNICAL MEMORANDUM

Date: **September 22, 2025**

To: **Nikki Skuce, Director, Northern Confluence and BC EAO**

From: **Martin Eunseo Shin (M.A.Sc., E.I.T.) and Rina Freed (Ph.D., P.Eng.)**

Subject: **Evaluation of the Proponent's Response to the Previous Comments - Eskay Creek Revitalization Application**

Source Environmental Associates Inc. (Source) was retained by Northern Confluence to review the Eskay Creek Mine Revitalization Application (the Application) submitted by Skeena Resources Limited (the Proponent). An initial technical memorandum was submitted on November 14, 2024, outlining concerns identified during the BC Environmental Assessment public review. Following that review, Skeena Resources submitted an updated Application in August 2025. This memorandum evaluates the Proponent's responses with a particular focus on water quality issues, as documented in the Public Engagement Report (pp. 86–90) and associated appendices.

The Eskay Creek Mine previously operated as an underground gold-silver mine from 1995 to 2008, producing 2.2 Mt of ore before entering care and maintenance. Skeena Resources acquired the site in 2020 and now proposes to redevelop it as an open pit operation with annual ore production of 3.0–3.6 Mt. The project is designed with a phased schedule of two years of construction, twelve years of operations, and a three-year closure transition period leading into post-closure.

A simple conceptual representation of the proposed project is included in Figure 1. The primary site components relevant to this review include the Tom Mackay Storage Facility (TMSF), Mine Rock Storage Area (MRSA), ore stockpiles, North Pit, and Water Treatments Plants (WTPs). Effluent from the treatment plants drains into Tom Mackay Creek. Ketchum Creek, Coulter Creek, Eskay Creek, Little Tom Mackay Creek and the Unuk River are also potentially influenced by the proposed project.

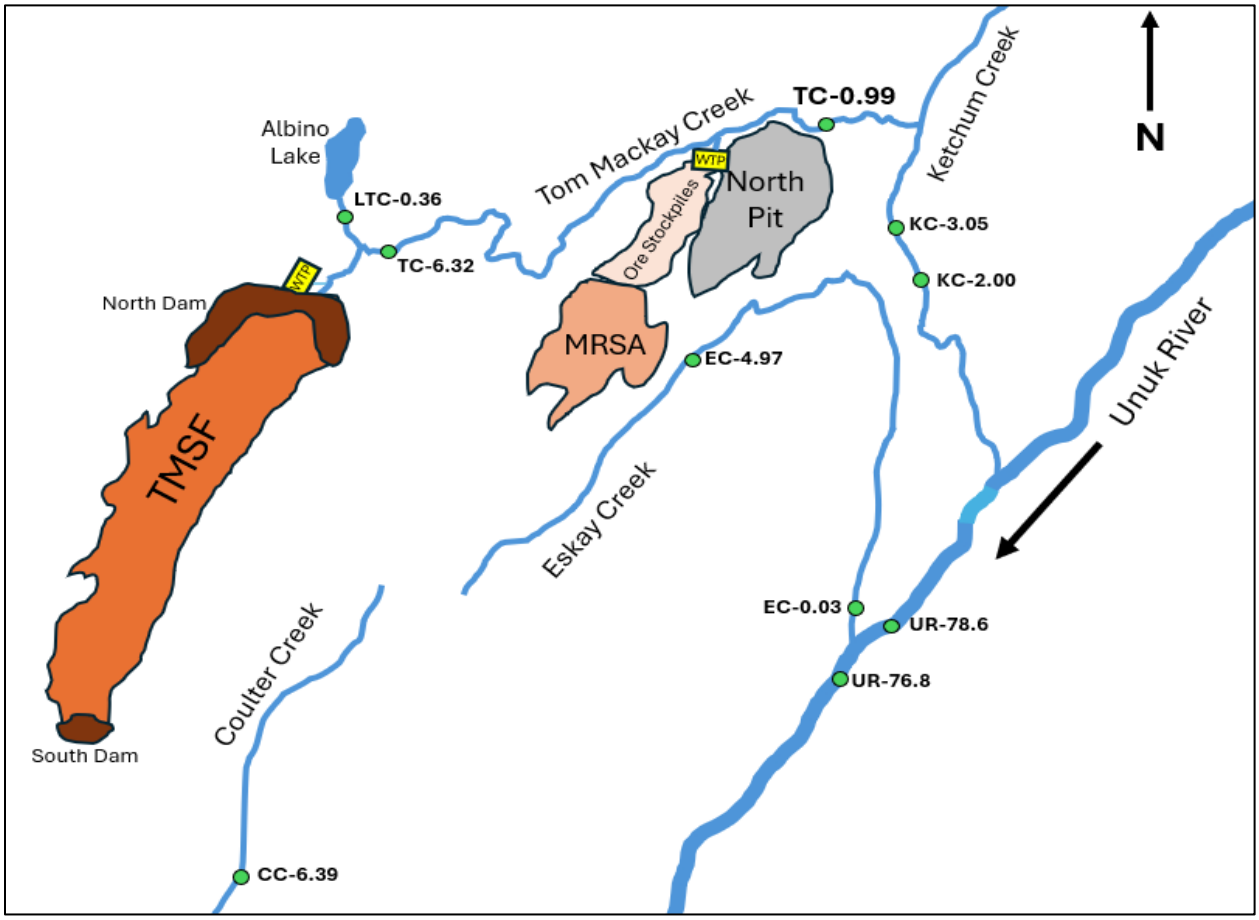

Figure 1. Project Key Component Overview[1]

During operations, approximately 160 Mt of PAG waste rock and 40 Mt of tailings will be placed in the TMSF, while about 130 Mt of NPAG rock will be stored in the MRSA. Mining of the North Pit is expected to conclude by the end of Year 9. Until then, contact water from the MRSA, ore stockpiles, and TMSF will be treated at the WTP located north of the TMSF, with treated effluent discharged into Tom Mackay Creek upstream of its confluence with Little Tom Mackay Creek. Beginning in Year 10, the North Pit will commence flooding, requiring a second WTP to manage contact water from the MRSA, ore stockpiles, and the pit, while the existing WTP will continue to treat excess TMSF water.

Discharges from the WTPs are expected to influence Tom Mackay Creek directly, with potential downstream effects on Little Tom Mackay Creek, Ketchum Creek, Coulter Creek, Eskay Creek, and ultimately the Unuk River.

[1] The model nodes incorporated in the surface water quality model (Lorax's WQM) are shown as round, green symbols.

Follow-up Response on the Previous Comment

1. Comment ID 28 - Mitigation Planning to Meet the Water Quality Guidelines and Permit Limits

The Proponent acknowledges that water quality modelling predicts exceedances of BC WQGs, including copper, nickel, zinc, and many other parameters, downstream of discharge points after implementation of Best Achievable Technology. They indicated that such exceedances do not necessarily imply unacceptable risks but rather indicate potential effects that require further investigation, which they suggest are addressed in other valued component chapters such as Fish and Fish Habitat and Human Health (Chapter 16 and Chapter 20). The Proponent further notes that mitigation planning will continue to be refined during the EA review and permitting processes, including through the application for an Initial Dilution Zone (IDZ). The Proponent states that it is not ENV policy or industry standard to enforce a 100 m length IDZ.

The response provided does not substantively resolve the concern raised. The Proponent's modelling predicts that water quality exceedances will extend along more than five kilometres of Tom Mackay Creek and Ketchum Creek. This represents a broad-scale and chronic impact on the water quality, which is fundamentally inconsistent with the typical requirements for BC mining projects. The EA stage should show that it is possible to meet WQGs or equivalent protection within the typical IDZ, and chronic toxicity should not occur beyond the IDZ boundary. In practice, provincial guidance typically treats 100 metres as the maximum extent of an IDZ. Suggesting that kilometre-scale exceedances can be reconciled with IDZ policy undermines the intent of the guidance and contradicts precedent for environmental protection standards.

The Proponent has provided assessments of residual effects in other valued component chapters (e.g., Fish and Fish Habitat in Chapter 16) with the predicted water quality. This work misses the development of equivalent protection such as proposed draft Science-Based Environmental Benchmarks (SBEBs) for the parameters predicted to exceed WQGs. SBEBs are used to establish thresholds for environmental protection where natural background conditions or toxicity modifying factors influence the applicability of provincial guidelines. Without proposed draft SBEBs, the assertion that exceedances do not necessarily imply unacceptable risks remains speculative. Reliance on general references to further assessment in other chapters does not substitute for proposed draft SBEBs and WQGs as clearly defined water quality targets. The submission does not establish the water quality criteria that must be met to avoid unacceptable environmental impacts. In the absence of SBEBs and clearly articulated trigger mechanisms for mitigation, there is no reliable process to ensure that predicted effects will be identified in time, effectively managed, and ultimately prevented from becoming residual impacts.

Given these deficiencies, the Application does not currently demonstrate that water quality guidelines or proposed draft SBEBs can or will be met in the receiving environment, nor that aquatic life will be adequately protected. The Proponent should therefore provide a clear

explanation and implementation of IDZ policy, develop site-specific SBEBs for parameters predicted to exceed generic water quality guidelines, and commit to explicit mitigation triggers tied to these benchmarks. This comment also applies to Comment ID 29 – 32.

Proposed EA Condition: We request an EA condition that requires the Proponent to meet WQGs or equivalent protection (i.e. approved SBEBs) within the typical IDZ, i.e. in the receiving environment 100 m downstream of any mine effluent or seepage released by the proposed project. This request applies to comments 29-33 as well.

2. Comment ID 29 - Parameters of Potential Concern – Sulfate

The Proponent explains that sulfate treatment at the scale and influent concentrations predicted for Eskay Creek is technically and economically challenging. They note that methods such as ettringite precipitation, Sulf-IX, and barium processes have only been applied on a limited scale and not at the level of treatment required for this project. For these reasons, sulfate treatment was excluded from the proposed WTPs during operations, with the potential need for treatment to be revisited in post-closure if warranted. Sulfate has been evaluated as a contaminant of potential concern in the Fish and Fish Habitat assessment (Chapter 16), which currently characterizes the risk as negligible.

While this provides some rationale, the response does not adequately address the concern. Regardless of technical and economic challenges, the Proponent is still required to ensure that contact water discharges achieve BC WQGs in the receiving environment, either through treatment, IDZ application, or development of site-specific SBEBs. The Proponent's water quality model predicts prolonged exceedances of sulfate beginning in operations and persisting through closure and post-closure, particularly at node TC-0.99 where effluent from the TMSF and later the North Pit converge. Without a clear mitigation plan, these exceedances represent a potential chronic residual effect that should not be dismissed.

It is unclear how sulfate will be managed to meet regulatory expectations over the long term. Reliance on generic fish and fish habitat assessments does not provide enforceable thresholds or triggers for action. The absence of SBEBs leaves the evaluation speculative and does not provide the necessary basis for determining when sulfate levels in the receiving environment pose a risk. In addition, monitoring and trigger mechanisms should be defined to ensure that if sulfate levels approach unacceptable thresholds, additional mitigation measures are implemented.

3. Comment ID 30 - Parameters of Potential Concern – Selenium

The Proponent explains that selenium was evaluated as a contaminant of potential concern in Chapter 16, given its potential hazards to aquatic resources in Tom Mackay Creek. They indicate that selenium is predicted to remain at or below the BC long-term guideline for the protection of aquatic life in areas accessible to fish, such as lower Ketchum Creek and the Unuk River. They

also state that the evaluation is being updated for the revised Application, using updated water quality predictions.

While predicted selenium concentrations in the receiving environment may not appear elevated, selenium is well known for its bioaccumulative properties, with the potential to concentrate in benthic invertebrates and transfer through the food web. Even at relatively low concentrations, this can lead to adverse effects on fish health, particularly reproductive impairment, that may not be evident from water column concentrations alone. The Proponent's effects assessment acknowledges bioaccumulation in invertebrates and classifies selenium as having a moderate residual cumulative effect.

As discussed in Comment ID 28 and 29, the Application should develop a clearer monitoring and management framework for selenium. Proposed monitoring should consider including tissue sampling of both benthic invertebrates and fish, with benchmarks tied to CCME tissue guidelines or SBEB. These benchmarks should be coupled with defined mitigation triggers to ensure that risks are identified early and addressed proactively. Without these mechanisms, the predicted moderate residual effects remain unmitigated, and there is no assurance that selenium-related risks will not accumulate over time, particularly in closure and post-closure phases.

4. Comment ID 31 - Parameters of Potential Concern – Nitrite and Nitrate

The Proponent explains that nitrogen species treatment was excluded from the BAT study on the basis that projected concentrations in mine contact water are below the level practically treatable with established removal systems. The Proponent also noted that they are not aware of analogue sites where treatment has been applied effectively at such low influent concentrations (<1 mg/L total nitrogen). Instead, they commit to developing a Nitrogen Management Plan to evaluate actual water quality against predictions and indicate that treatment may be considered if nitrogen levels prove to be significantly higher than projected.

While it is acknowledged that treatment of nitrogen species can be challenging when influent concentrations are below 1 mg/L, the modelling results presented in the Application show predicted exceedances of BC water quality guidelines. Specifically, nitrite concentrations are projected to exceed the short-term (acute) aquatic life guideline at the TMSF discharge point during operations, and chronic exceedances are projected at node TC-0.99 downstream of the effluent discharge. These exceedances are not consistent with the principle of an IDZ, where acute toxicity is not permitted within the mixing zone, nor are they adequately addressed by the suggestion that treatment is only warranted if future monitoring demonstrates higher-than-expected concentrations. Additional residence time should be considered as a means to reduce the nitrite concentrations sufficiently.

In order to meet regulatory requirements and ensure the protection of aquatic life, the Proponent should commit to more than a deferred, conditional approach. As outlined in the previous

comments, development of SBEBs for nitrogen species and a defined IDZ application are needed to establish thresholds for compliance. The Nitrogen Management Plan should include clear monitoring protocols, benchmark-based triggers, and adaptive mitigation measures that can be implemented if model-predicted exceedances occur, rather than waiting for long-term confirmation.

5. Comment ID 32 - Parameters of Potential Concern – Other Metals

The Proponent indicates that the BAT study incorporates best achievable technology for metals removal and that bench testing will be conducted during detailed WTP design. They suggest that water quality exceedances reflect potential for increased effects that should be addressed through additional investigations, and they point to related assessments in the Fish and Fish Habitat (Chapter 16) and Human Health (Chapter 20) sections.

While these clarifications are noted, the response does not resolve the fundamental concern. The Proponent's water quality model predicts that cadmium, copper, and zinc will exceed acute BC WQGs at the effluent discharge point, with molybdenum also exceeding guideline values. Acute exceedances within or beyond the IDZ are not consistent with the principle of water quality protection, as an IDZ is intended to be a short, localized zone where limited exceedances may occur, but where aquatic life must be fully protected outside its boundary.

Moreover, while the Proponent notes that guideline exceedances may be influenced by toxicity-modifying factors, this underscores the need for proposed draft SBEBs. For these metals, which are predicted to result in moderate residual cumulative effects, enforceable benchmarks tied to monitoring and adaptive mitigation are essential to prevent residual impacts from becoming chronic and unmanaged.

The Application would therefore be strengthened by (i) an application of IDZ policy demonstrating how WQG (or SBEBs) exceedances will be prevented outside a defined mixing zone, (ii) the development of proposed SBEBs for cadmium, copper, zinc, and molybdenum where WQGs are predicted to be exceeded, and (iii) clearly defined mitigation triggers linked to monitoring results to ensure that water treatment achieves its intended protective function. Without these commitments, there remains insufficient confidence that the proposed WTP design can protect aquatic life from both acute and chronic risks associated with these metals.

6. Comment ID 33 - Collection of TMSF Dam Seepage

The Proponent acknowledges the need for seepage management and monitoring and indicates that a plan will be submitted as part of the Major Mines Permit Application in accordance with JAIR requirements. This commitment is noted.

It is therefore recommended that development and implementation of a comprehensive seepage management and monitoring plan be included as an Environmental Assessment Condition. This

plan should include routine monitoring of seepage flow and chemistry, defined triggers for adaptive management, and clear provisions for contingency measures, such as additional groundwater interception system.

7. Comment ID 34 - Low Grade Ore Stockpile

Low-grade ore is classified as potentially acid-generating and poses a risk of acid generation and metal leaching if left unprocessed at closure or during temporary care and maintenance. It is recommended that an EA condition requires assessment and inclusion of low-grade ore processing within the Reclamation and Closure Cost Liability Estimate (RCLE) to ensure that this potential liability is fully addressed. At the time of review, the volume of low-grade ore that may remain unprocessed at closure remains uncertain, highlighting the need for conservative assumptions in closure planning and costing.

8. Comment ID 35 - Water Quality from the Previous Mine Operation

The Proponent acknowledges that legacy mining has contributed to ongoing water quality influences in the Tom Mackay and Eskay Creeks and states that a strategy to address these impacts is being developed under existing permits. Proposed measures include reclamation of disturbed areas, relocation of waste rock stockpiles, and plugging of exploration drillholes. This acknowledgement and commitment are important steps toward addressing historical contamination.

Nonetheless, the response does not provide sufficient detail to evaluate the adequacy of the proposed strategy. Elevated contaminant concentrations continue to exceed BC water quality guidelines, representing an ongoing risk to aquatic life and the receiving environment. Without access to a comprehensive site restoration plan, it remains unclear whether the proposed measures will be sufficient to restore water quality to pre-mining conditions or, at a minimum, achieve compliance with water quality guidelines.

As an EA Condition it is recommended that the Proponent provide a detailed site restoration plan for review, including specific targets, timelines, and monitoring commitments, so that regulators, Tahltan, and stakeholders can assess whether legacy impacts will be effectively remediated.

9. Comment ID 36 - Long-term Water Treatment Assessment and Table 5-1

The Proponent's response clarifies that the analysis on page 6-2 pertains only to the potential for passive discharge from the TMSF, while the statement on page 6-3 addresses the need for water treatment at the North Pit. While this clarification is helpful, it does not fully resolve the concern raised in the original review comment. Table 5-1 of the WQM lists several parameters as "NA*" (not applicable), yet these parameters are predicted to exceed applicable WQGs. The Proponent explains that the concentrations of these parameters are greater than the WTP treatment levels. However, this distinction does not consider the fact that WTP treatment design objectives that

exceed WQGs may pose a long-term risk, especially given uncertainties in post-closure hydrology and geochemical conditions.

To demonstrate that the water quality objectives will be reliably achieved, the Proponent should reconcile Table 5-1 with the supporting discussion by clearly identifying which parameters are expected to require long-term treatment, define the conditions under which the TMSF WTP could be decommissioned, and demonstrate whether a single North Pit WTP would be sufficient to meet WQGs in post-closure. Consideration of uncertainty and contingency measures is also necessary to ensure effective mitigation should actual conditions diverge from model predictions.

10. Comment ID 37 - Selenium Reduction through Enhanced HDS Plant

The Proponent has provided references and supporting documentation regarding the assumption of partial (20%) selenium reduction through HDS lime neutralization. While this is not commonly assumed with HDS plants, this comment is closed.

11. Comment ID 38 - Metal Leaching Assessment for NPAG Rock

The reviewer acknowledges the response and considers the comment closed.

Closing Remarks

Thank you for the opportunity to provide a review of the revised Eskay Creek Revitalization Application. If you have any questions, please contact the undersigned.

Yours truly,

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