Environmental Protection Operations Directorate
Pacific and Yukon Region
101 - 401 Burrard Street
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February 28, 2024

CIAR: 80087
ECPT: 14-1201

Stefan Crampton
Project Manager
Impact Assessment Agency of Canada
210A-757 West Hastings Street
Vancouver, BC
V6C 3M2

Dear Stefan Crampton,

Re: Crown Mountain Coking Coal Project – Environment and Climate Change Canada Comments for the Technical Review of the Environmental Impact Statement / Application (Round 1)

On January 29, 2024, the Impact Assessment Agency of Canada (the Agency) initiated technical review of the Environmental Impact Statement / Application (EIS/A) for the Crown Mountain Coking Coal Project (the Project) proposed by NWP Coal Canada Ltd. (the Proponent). The Agency requested Environment and Climate Change Canada (ECCC) undertake a detailed technical review of the EIS/A for the Project and make available ECCC specialist or expert knowledge or information to enable the review of the Project and its predicted environmental effects.

ECCC's response to this request is included as three attachments to this letter (Annex 1: Advice to the Agency, Annex 2: Information Requests Directed to the Proponent, and Annex 3: Advice to the Proponent). In Annex 2, ECCC's technical advice is provided in two parts: a rationale and a request. Should ECCC's comments be transcribed to a separate tracking table for information management and/or comment tracking purposes, both parts of ECCC's comments (i.e., the rationale and the request) need to be carried over to accurately reflect ECCC's technical advice. ECCC's comments are founded upon departmental mandate and are related to water quality and its effects on fish, water quantity, species at risk, migratory birds, accidents and malfunctions, air quality and greenhouse gas emissions.

Please note that ECCC is providing technical, science-based information and knowledge, pursuant to its mandate[1], to inform the assessment of this Project's potential effects in the receiving environment and on valued ecosystem components. The information provided by ECCC has been prepared based upon the Project documentation made available to date. Should changes occur to the proposed Project, ECCC's advice may need to be revised. Any information or comments received from ECCC in this context does not relieve the Proponent of its obligations to respect all applicable federal Acts and regulations.

[1] https://www.canada.ca/en/environment-climate-change/corporate/transparency/acts-regulations/acts-administered.htm

If you have any questions or concerns regarding the advice provided in the attached, please do not hesitate to contact Christie Spry at 778-726-3364 or Christie.Spry@ec.gc.ca.

Regards,

<Original signed by>

Christie Spry
Senior Environmental Assessment Officer
Environment and Climate Change Canada / Government of Canada

Annex 1: Advice to the Agency
Annex 2: Information Requests Directed to the Proponent
Annex 3: Advice to the Proponent

Cc: Fraser Ross, Impact Assessment Agency of Canada

Impact Assessment Agency of Canada | Agence d'évaluation d'impact du Canada

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ANNEX 1: Advice to the Agency

Table 1: Advice for the Agency's consideration in its recommendation to the Minister of Environment and Climate Change and preparation of draft potential conditions

Questions	Responses/Comments
• Has the Proponent described all project components and activities in sufficient detail to understand all relevant project-environment interactions? If not, identify what additional information is needed.	**Water Quality and Quantity** The height of Mine Rock Storage Facility (MRSF) lifts is inconsistent within the document (ranges from 20m to 50m) and it is unclear how the lift height affects anoxia within the MRSF. Reference comments ECCC-IR-59 and ECCC-IR-66 for more information.

• Were the study areas sufficient to predict potential effects from all relevant Project-environment interactions, and to consider the effects within a local and regional context?
• Is the baseline information sufficient to characterize the existing environment, predict potential effects and obtain monitoring objectives? If not, identify what additional information is needed.
	Species at Risk and Migratory Birds
	Reference comments ECCC IR-13, ECCC-IR-14, ECCC-IR-15, ECCC-IR-33, ECCC-IR-34, ECCC-IR-35, ECCC-IR-38, ECCC-IR-40, ECCC-IR-41, ECCC-IR-43, ECCC-102, and ECCC-128 for more information.
	
	Water Quality and Quantity
	• Study areas:
	  ○ Groundwater LSA did not include all Project components (particularly Grave Creek watershed; see ECCC-IR-53).
	  ○ The study areas for the surface water quality RSA and Fish and Fish Habitat RSA do not capture all potential cumulative effects of the Project (see ECCC-IR-74).
	  ○ The surface water quality RSA does not include the American portion of Lake Koocanusa. The RSA is cut off at the border, despite the fact that the Proponent acknowledges that transboundary effects are possible (see ECCC-IR-73).
	• Baseline information:
	  ○ Baseline information for water quality and aquatic life is not sufficient (see ECCC-IR-56 and ECCC-IR-61).
	  ○ Baseline information for groundwater quality is insufficient (see ECCC-IR-54).

Alternatives Assessment	

• Has the Proponent adequately described the criteria it used to determine the technically and economically feasible alternative means?
• Has the Proponent listed the potential effects to valued components (VCs) within your mandate that could be affected by the technically and economically feasible alternative means?
• Has the Proponent adequately described why it chose each preferred alternative means?
• Are there other alternative means that could have been presented? If so, please describe.
	Water Quality and Quantity
	Chapter 2 of the EIS/A discusses alternative source control measures and explains why they were rejected; however, the EIS/A does not discuss which water treatment options were considered and why they were rejected. Water treatment is separate from source control and is one of the most common and commercially proven mitigation measures for selenium. It is generally recognized as an integral part of any selenium management plan. Various types of active and passive treatment for selenium-contaminated waters exist, including physical, chemical, and biological treatment. In ECCC's view, it is still unclear which types of water treatment were considered and why they were rejected. The chosen method of mitigation is unproven (ECCC-IR-51), so the Proponent should fully evaluate alternative means because they may need to implement them in order to mitigate Project effects.
	
	Air Quality, Greenhouse Gases and Climate Change
	• In section 2.5.1.6 (Mine equipment selection), the Proponent evaluates the choice between electrically powered drills and shovels and diesel-powered drills and shovels. A broader evaluation of mobile fleet decarbonization technologies could include:
	  ○ battery-electric vehicles;
	  ○ low-carbon fuels such as biodiesel, LNG blended engines; and
	  ○ trolley-assist technology (see ECCC-IR-86).
	• Mobile fleets represent the largest source (up to 60%) of GHG emissions for the Project. ECCC recommends electrification and other decarbonization technologies be considered for the Project.
	• In Chapter 33 (Air Quality and GHG Management Plan), the Proponent commits to investigating, at a later date, the possibility of using zero-emission electric vehicles and low-emission vehicles as part of its fleet (see ECCC-IR-87). This will be important to capture in the required follow-up and monitoring programs for the Project.

Environmental Effects Assessment	

Questions	Responses/Comments
• Has the Proponent clearly described all relevant pathways of effects to be taken into account under section 5 of CEAA 2012? • Has the Proponent identified all potential effects to VCs, including species at risk, within your mandate? • Were all potential receptors considered?	**Species at Risk and Migratory Birds** Reference comments ECCC-IR-02, ECCC-IR-07, ECCC-IR-08, ECCC-IR-17, ECCC-95, ECCC-98, ECCC-99, ECCC-129, and ECCC-130 for more information. **Water Quality and Quantity** The EIS/A does not assess impacts to aquatic life from groundwater quality (ECCC-IR-52). Reference comment ECCC-IR-53 for more information.
• Were the methodologies used by the Proponent appropriate to collect baseline data and predict effects, why or why not? • Has the Proponent explicitly addressed the degree of scientific uncertainty related to the data and methods used within the assessment? If there are unaccounted for scientific uncertainties, describe them and indicate the options for increasing certainty in the predictions?	**Species at Risk and Migratory Birds** Methods to collect baseline data and predict effects for whitebark pine and American badger were not appropriate. The Proponent has not addressed uncertainty related to whitebark pine. See comments ECCC-IR-34 to ECCC-IR-49, ECCC-135 and ECCC- 136 for whitebark pine and ECCC-101, ECCC-102, and ECCC-107 for American badger. Reference comments ECCC-IR-04, ECCC-IR-09, ECCC-IR-13, ECCC-IR-16, ECCC-IR-28, ECCC-IR-33, ECCC-93, ECCC-97, and ECCC-121 for more information. **Water Quality and Quantity** Methodologies used by the Proponent were not appropriate: • Geochemical testing of mine waste rock is inadequate (see ECCC-IR-51). • The calculation(s) to produce the geochemical source terms were not provided, so ECCC cannot assess whether the methodologies for the water quality model were appropriate (see ECCC-IR-59). • Issues with the methodologies used to predict effects (see ECCC-IR-51, ECCC-IR-56, ECCC-IR-57, ECCC-IR-58, ECCC-IR-60, ECCC-IR-61, ECCC-IR-62, ECCC-IR-63, ECCC-IR-64, and ECCC-IR-65). • Issues with the bioaccumulation model (see ECCC-IR-78 and ECCC-IR-79). • Selenium speciation not addressed (see ECCC-IR-82). The efficiency of the MRSF is highly uncertain, which results in the inputs to the water quality model being uncertain and potentially overly optimistic. The water quality model adds additional uncertainty because of data gaps and assumptions (note this is inherent to the use of a model as no model has low uncertainty). The bioaccumulation model is based on the predicted MRSF efficiency and the water quality model, thus has even higher uncertainty. The Proponent has not acknowledged the extent of the uncertainty. Options for increasing certainty in predictions include pilot testing the MRSF, fully developing a contingency plan, and using more conservative input parameters (see ECCC-IR-51). Reference comments ECCC-IR-67 and ECCC-IR-92 for more information. **Air Quality, Greenhouse Gases and Climate Change** The EIS/A does not address the impact of climate change on water quantity aspects of the project. Climate change was not included in the modelling and variables used to determine the water management structures on site (see ECCC-IR-50 and ECCC-IR-91).
• Are the predicted effects described in objective and reasonable terms (e.g., beneficial or adverse, temporary or permanent, reversible or irreversible)?	**Water Quality and Quantity** Reference comments on the residual effects characterization for changes in surface water (see ECCC-IR-69, ECCC-IR-70, and ECCC-IR-71), the residual effects characterization for changes in water quality to Fish and Fish Habitat (see ECCC-IR-77), and water quantity (see ECCC-IR-89).
• Has the Proponent adequately assessed the potential cumulative environmental effects, including using appropriate temporal and spatial boundaries, examining physical activities that have been and will be carried out, and proposing mitigation and follow-up program requirements? Provide rationale.	**Species at Risk and Migratory Birds** The Proponent has not adequately assessed the potential cumulative environmental effects for species at risk and migratory birds, including examining physical activities that have been and will be carried out, and proposing mitigation and follow-up program requirements. Reference comments ECCC-IR-26, ECCC-IR-27, ECCC-IR-28, ECCC-IR-29, ECCC-IR-31, ECCC-IR-35, ECCC-IR-36, ECCC-IR-48, ECCC-IR-49, ECCC-112, ECCC-114, and ECCC-115 for more information. **Water Quality and Quantity** There is no follow-up program described for water quantity. Reference comments ECCC-IR-73, ECCC-IR-74, ECCC-IR-75, and ECCC-IR-81 more for information.

Questions	Responses/Comments
• Has the Proponent adequately described the potential for environmental effects caused by accidents and malfunctions, including the types of accidents and malfunctions, their likelihood and severity and the associated potential environmental effects? If not, identify what additional information is needed.	**Species at Risk and Migratory Birds** Reference comments ECCC-IR-12, ECCC-116, ECCC-117 for more information. **Accidents and Malfunctions** Reference comment ECCC-142 for more information. **Water Quality and Quantity** It is critical that the likelihood and severity of MRSF chemical failure/reduced effectiveness be assessed (see ECCC-IR-64), given the uncertainty of this mitigation measure (ECCC-IR-51).
• Are you satisfied with the Proponent's assessment of effects of the environment on the Project? • Has the Proponent characterized the likelihood and severity appropriately? Provide rationale.	**Water Quality and Quantity** Reference comments ECCC-IR-50 and ECCC-IR-91 more for information. **Air Quality, Greenhouse Gases and Climate Change** Climate change must be taken into consideration for the modelling of the Project and its potential impact on the water quantity over the duration of the Project lifetime (see ECCC-IR-89 and ECCC-IR-90).
• Has the Proponent sufficiently described and characterized the Project activities and components as they relate to federal decisions within your mandate? If not, identify what additional information is needed. • Are changes to the environment, as they relate to federal decisions within your mandate, sufficiently described? If not, identify what additional information is needed.	More information may be required to comply with the *International Rivers Improvement Act*.
Mitigation	
• Has the degree of uncertainty regarding the effectiveness of the proposed mitigation measures been described? If not, identify what information is needed. • Is it clear how each proposed mitigation measure links to each potential pathway of effect?	**Water Quality and Quantity** The degree of uncertainty in the efficacy of the MSRF (i.e., primary mitigation measure proposed for water quality and its effects on fish) is underestimated (see ECCC-IR-51). Reference comments ECCC-IR-64, ECCC-IR-80, and ECCC-IR-83 for more information.
• Would you propose different or additional mitigation measures? If so, provide a description of the mitigation measure(s), with rationale.	**Species at Risk and Migratory Birds** Reference comments ECCC-IR-05, ECCC-IR-11, ECCC-IR-19 to ECCC-IR-24, ECCC-IR-32, ECCC-IR-37, ECCC-IR-45, ECCC-105, ECCC-106, ECCC-107, ECCC-109, ECCC-123, ECCC-125, ECCC-126, ECCC-129, ECCC-130 and ECCC-135 for more information. **Air Quality, Greenhouse Gases and Climate Change** Reference comments ECCC-IR-88, ECCC-138, ECCC-140, and ECCC-144 for more information. **Water Quality and Quantity** ECCC suggests additional mitigation measures for source control and water treatment are needed given uncertainty associated with efficacy of MSRF. Active water treatment could be considered as part of a contingency measure and should be used in combination with other contingency measures in order to mitigate effects. Reference comments ECCC-IR-51, ECCC-IR-64, ECCC-IR-82 and ECCC-IR-83 for more information.
• Which of the proposed mitigation measures and/or project design elements do you consider to be necessary to reduce the likelihood of significant adverse environmental effects? Provide rationale.	**Species at Risk and Migratory Birds** • Habitat offsetting. Reference comments ECCC-107, ECCC-125 and ECCC-135 for more information. **Accidents and Malfunctions**

Questions	Responses/Comments
	• The preparedness measures (e.g., Spill Prevention, control, and countermeasures Plan) and mitigation measures that lessen the probability of an accident or malfunction from occurring during the course of the Project (see ECCC-141). **Water Quality and Quantity** • The primary mitigation measure for water quality needs to be effective in order to reduce likelihood of adverse environmental effects. The MRSF is currently proposed, but alternative measures (e.g., water treatment or other forms of source control) may need to be implemented to improve confidence in the Proponent's ability to mitigate Project effects (see ECCC-IR-51). • Clean water diversions are typically a primary mitigation measure for water quality at mines; however, the Proponent has determined that these are not technically feasible for the Project (see ECCC-IR-66).
Residual Adverse Environmental Effects	
• Are the identification and documentation of residual environmental effects described by the Proponent adequate? If not, what are the aspects for which there is uncertainty and, where possible, indicate how these residual effects can be best described. If there is uncertainty, what are the options for increasing certainty?	**Species at Risk and Migratory Birds** Reference comments ECCC-IR-12, ECCC-IR-17, ECCC-IR-25 to ECCC-IR-29, ECCC-IR-47 to ECCC-IR-49, ECCC-103, ECCC-110 to ECCC-113, ECCC-115, ECCC-121, ECCC-122, ECCC-124, and ECCC-136 for more information. **Water Quality and Quantity** • See comments on the residual effects characterization for changes in surface water (see ECCC-IR-69, ECCC-IR-70, ECCC-IR-71) and the residual effect characterization for changes in water quality to Fish and Fish Habitat (ECCC-IR-77). Reference comments ECCC-IR-51, ECCC-IR-52, ECCC-IR-54, ECCC-IR-64, and ECCC-IR-83 for more information. **Air Quality, Greenhouse Gases and Climate Change** • Mobile fleet emissions represent the largest source (60%) of GHG emissions associated with the Project. ECCC considers electrification of the mobile fleet to be an important pathway to decarbonization that should be considered by the Proponent to mitigate Project effects. ECCC notes battery-electric vehicles are being pursued already in the region by Teck (Teck and Caterpillar to Advance Zero-Emissions Mining Haul Trucks), and other technologies such as trolley-assist have been demonstrated in the mining sector (see ECCC-IR-86 and ECCC-IR-87).
• Did the Proponent provide a sufficiently precise, ideally quantitative, description of the residual environmental effects related to your mandate? Identify any areas that are insufficient.	**Water Quality and Quantity** • See comments on the residual effects characterization for changes in surface water (see ECCC-IR-69, ECCC-IR-70, ECCC-IR-71) and the residual effects characterization for changes in water quality to Fish and Fish Habitat (ECCC-IR-77). Reference comment ECCC-IR-68 for more information.
Determination of Significance	
• Are the conclusions on significance in the EIS/A/A supported by the analysis that is provided? • Are the Proponent's proposed criteria for assessing significance appropriate? This includes how the criteria were characterized, ranked, and weighted. Provide rationale. Where the Proponent has *not* used one of the Agency's recommended key criteria (magnitude, geographic extent, duration, frequency, reversibility, and social/ecological context), has a rationale been provided?	**Species at Risk and Migratory Birds** The conclusions on significance in the EIS/A for wildlife and vegetation VCs are not supported by the analysis that is provided. The Proponent's proposed criteria for assessing significance for wildlife VCs is not appropriate. Reference comments ECCC-IR-25, ECCC-IR-27 to ECCC-IR-29, ECCC-IR-49, ECCC-103, ECCC-104, ECCC-110 to ECCC-113, ECCC-115, ECCC-122, ECCC-124, and ECCC-136. **Water Quality and Quantity** • The Proponent does not have a documented approach on how the criteria were integrated to determine significance. See ECCC-IR-52 (aquatic life guidelines groundwater quality) and ECCC-IR-73 (FEQG Se guidelines). • Significance thresholds for water quality and fish and fish habitat are unclear (see ECCC-IR-66 and ECCC-IR-71). • In the Surface Water Quality chapter, the EIS/A states: "*a significant adverse residual environmental effect on surface water quality is one where the Project degrades the physical and chemical characteristics of surface water to the extent that interaction with local surface water results in chemistry changes that may adversely affect aquatic life*." However,

Questions	Responses/Comments
	significance is based on the integration of six criteria (duration, magnitude, geographic extent, frequency, reversibility, and context; CEAA 2018). It is unclear how the EIS/A integrates the residual effect characterization to determine if there is a significant effect. Reference comments ECCC-IR-69 and ECCC-IR-70 for more information regarding whether conclusions on significance in the EIS/A/A are supported by the analysis that is provided. Reference comments ECCC-IR-55, ECCC-IR-72, ECCC-IR-76 for more information regarding whether the Proponent's proposed criteria for assessing significance are appropriate.
• Were appropriate methodologies used in developing the conclusions on significance?	**Species at Risk and Migratory Birds** More information on the methodologies used is required to determine appropriateness. **Water Quality and Quantity** • Methodologies for significance determinations were unclear (see ECCC-IR-66 and ECCC-IR-71). • The groundwater significance determination did not take aquatic life into account (see ECCC-IR-70). • The methodology for determining magnitude is unclear (ECCC-IR-72). • The residual effects were underestimated (see ECCC-IR-69, ECCC-IR-70, ECCC-IR-71, and ECCC-IR-77).
• Do you agree with the Proponent's analysis and conclusions on significance? Provide rationale.	**Species at Risk and Migratory Birds** Reference ECCC-IR-25, ECCC-IR-27, ECCC-IR-28, ECCC-IR-29, ECCC-IR-49, ECCC-103, ECCC-104, ECCC-110 to ECCC-113, ECCC-115, ECCC-122, ECCC-124, and ECCC-136 for more information. **Water Quality and Quantity** The Proponent determined effects to Surface Water Quality and water quality changes to Fish and Fish Habitat were "not significant" for both Project-related effects and cumulative effects. ECCC has identified issues with the Proponent's characterization of "low" magnitude in some cases (see ECCC-IR-72). The EIS/A may also underestimate the geographic extent, duration, reversibility, and context of Project effects (see ECCC-IR-66, ECCC-IR-69 to ECCC-IR-71, and ECCC-IR-77).
Monitoring and Follow-up	
• Does the proposed monitoring and follow-up program verify the predictions of the environmental assessment as they relate to section 5? Please explain additional monitoring or follow-up needed to address uncertainty in the effects assessment.	**Species at Risk and Migratory Birds** Reference comments ECCC-IR-21, ECCC-IR-45, ECCC-108 and ECCC-135 for more information. **Water Quality and Quantity** Reference comments ECCC-IR-63 (monitoring for TSS and dust deposition), ECCC-IR-77 (mitigation measures and monitoring for organic selenium), ECCC-IR-78 (contingency mitigation plans), ECCC-IR-79 (follow up water quality monitoring plans), and ECCC-IR-80 (follow up aquatic effect monitoring program) for more information.
• Does the proposed monitoring and follow-up program verify the effectiveness of proposed mitigations as they relate to section 5? Please explain additional monitoring or follow-up needed to address uncertainty in the proposed mitigation.	**Species at Risk and Migratory Birds** Reference comments ECCC-IR-21, ECCC-IR-45, ECCC-108 and ECCC-135 for more information. **Water Quality and Quantity** Reference comments ECCC-IR-51, ECCC-IR-55, and ECCC-IR-82 for more information.
• Is the objective of the follow-up program clear and measurable? • Does the follow-up program include sufficient detail, and technical merit, for the Agency to achieve the stated objective through a condition (e.g., sufficient baseline dataset, monitoring plans, acceptable thresholds of change, contingency procedures)?	**Species at Risk and Migratory Birds** Insufficient baseline information, unclear thresholds for change, and a lack of contingency measures. Reference comments ECCC-IR-51, ECCC-IR-55, and ECCC-IR-82 for more information. **Water Quality and Quantity** Follow-up programs lack detail required to understand the objectives of the programs and verify whether they will be achieved. Reference comments ECCC-IR-84, ECCC-IR-85 and ECCC-143 for more information.
• Are you aware of any federal or provincial authorizations or regulations that will achieve the same follow-up program objective(s)? If so, how do these achieve the objective(s)?	

Questions	Responses/Comments
Additional comments, views, advice	
• Provide any other comments.	**Species at Risk and Migratory Birds** • Selenium speciation does not appear to be considered in Chapter 22 – Human and Ecological Health Assessment. ECCC notes that characterization of selenium species potentially released by the Project is an important factor to consider. For example, selenate and selenite are predominant forms of selenium in surface water, but they differ in their propensity to enter food webs and bioaccumulate in plants and wildlife. As such, selenium speciation is an important factor to consider when evaluating risks to wildlife and this information should be included in the EIS/A. **Air Quality, Greenhouse Gas Emissions and Climate Change** Reference comment ECCC-137 for more information.

ANNEX 2: Information requests directed to the Proponent

Table 2: Comments and suggestions for information requests to be directed to the Proponent

IR Number (e.g. HC-IR-01)	Project Effects Link to CEAA 2012	Reference to EIS/A/A Guidelines	Reference to EIS/A/A	Context and Rationale	Specific Question/ Request for Information
ECCC-IR-01	5(1)(a)(i) Fish and Fish Habitat 5(1)(a)(iii) Migratory Birds	6.1.6. Migratory Birds and their Habitat: Exposure to relevant contaminants of concern (see section 6.1.2) based on data from existing sources.	Chapter 22 – Human and Ecological Health Assessment; Table 22.4-1: Base Case – Fundamental Exposure Assessment Approach and Assumptions (AECOM, 2021), page 22-22.	The EIS/A Guidelines indicate the assessment of exposure to relevant contaminants of concern for migratory birds should be based on data from existing sources. Table 22.4-1 of the EIS/A outlines the parameters evaluated as part of the ecological risk assessment, and all contaminant data for various receptors of interest (e.g. fish eggs, bird tissue, bird eggs, etc.) appear to be modelled from measured abiotic environmental values (e.g., surface water and soil contaminant concentrations). Biological monitoring data exists for various receptor species sampled in the Elk Valley, BC. For example (but not limited to), selenium tissue data are available for an avian valued component, the American dipper (*Cinclus mexicanus*) (English et al., 2022; available here: https://doi.org/10.1016/j.envres.2022.112702). Clarification around the potential effects observed (or not observed) in various valued ecological components, specifically related to aquatic-dependent egg-laying vertebrates, and their habitat in the Elk Valley is necessary to adequately evaluate potential effects of the Project on wildlife health in the region.	ECCC recommends that the EIS/A include biological and health data from existing wildlife monitoring programs in the Elk Valley, BC to inform and provide additional context to the ecological health assessment.
ECCC-IR-02	5(1)(a)(iii) Migratory Birds	6.1.6. Migratory Birds and their Habitat: Exposure to relevant contaminants of concern (see section 6.1.2) based on data from existing sources.	Chapter 22 – Human and Ecological Health Assessment; Figure 22.5-1: Conceptual Exposure Model for Ecological Risk Evaluation, page 22-34.	Figure 22.5-1 (Conceptual Exposure Model for Ecological Risk Evaluation) presents various sources and pathways by which contaminants may enter the environment as a result of the Project. Further, the conceptual model indicates how certain receptors, for example avian wildlife, may be exposed to contaminants associated with Project activities. It is not clear from the model presented whether ingestion of benthic invertebrates was considered as an important exposure pathway to migratory birds (for contaminants such as selenium). Various bird species in the Elk Valley, BC have been shown to bioaccumulate selenium primarily through consumption of invertebrates (English et al., 2022; Harding et al., 2005). References: English, S. G., Hess, H., Bishop, C. A., Porter, E., Cheng, K. M., & Elliott, J. E. (2022). Bioaccumulation and effects of selenium from surface coal mining in an aquatic songbird. Environmental Research, 208, 112702. https://doi.org/10.1016/j.envres.2022.112702 Harding, L. E., Graham, M., & Paton, D. (2005). Accumulation of Selenium and Lack of Severe Effects on Productivity of American Dippers (*Cinclus mexicanus*) and Spotted Sandpipers (*Actitis macularia*). Archives of Environmental Contamination and Toxicology, 48(3), 414–423. https://doi.org/10.1007/s00244-004-0004-5	ECCC recommends that additional information be provided in the EIS/A to demonstrate how ingestion of benthic invertebrates was evaluated as a source of contaminant exposure to avian receptors from the Project. If ingestion of benthic invertebrates was not evaluated, ECCC recommends including this exposure pathway for avian receptor species.
ECCC-IR-03	5(1)(a)(iii) Migratory Birds	6.1.6. Migratory Birds and their Habitat: Exposure to relevant contaminants of concern (see section 6.1.2) based on data from existing sources.	Appendix 22A – Detailed Quantitative Environmental Risk Assessment. Section 5.3 Hazard Assessment; 5.3.1 Toxicity Assessment; Table 5-5 through Table 5-9; pages 58 to 59. Appendix 22A – Detailed Quantitative	Tables 5-5 to 5-9 (pages 58-59) of Appendix 22A identifies the toxicological benchmarks used for the assessment of aquatic health risks to various valued components, including a surface water benchmark of 0.203 mg selenium/L for waterbirds. Toxicological benchmarks for selenium in bird eggs exist (6 µg/g dry weight; BC MOE, 2014), and it is unclear why these were not considered in the ecological risk assessment (even though bioaccumulation of selenium in bird eggs is modelled on page 28 of Appendix 22A – Detailed Quantitative Environmental Risk Assessment).	ECCC recommends that the aquatic health risk assessment for water birds include a comparison of the results of the bioaccumulation modelling of selenium in bird eggs (located on page 28 of Appendix 22A) to the toxicological benchmark for selenium in bird eggs (e.g., 6 µg/g dry weight; BC MOE, 2014) to assess the potential effects to migratory birds as a result of the Project.

			Environmental Risk Assessment. Table 3-1: Fundamental Exposure Assessment Approach and Assumptions; page 28.		
ECCC-IR-04	5(1)(a)(i) Fish and Fish Habitat 5(1)(a)(iii) Migratory Birds	6.6.2. Effects of the Environment on the Project; 6.6.3. Cumulative Effects Assessment; 6.1.6. Migratory Birds and their Habitat: Exposure to relevant contaminants of concern (see section 6.1.2) based on data from existing sources.	Chapter 22 – Human and Ecological Health Assessment; Section 22.6.4 Identification of Cumulative Effects; pages 22-58 to 22-63.	The cumulative effects assessment completed for terrestrial and aquatic wildlife health considers other ongoing or reasonably foreseeable future projects, as well as temporal effects associated with the Project (e.g., incremental changes to soil contaminant concentrations over the lifespan of the Project). Selenium is mobilized when rock overburden and waste materials are crushed and exposed to natural weathering processes (US EPA, 2018). It is not clear whether environmental factors that contribute to selenium mobilization (e.g., precipitation, climate change, etc.) were considered in the cumulative effects assessment. <u>Reference:</u> US EPA, 2018: DRAFT Aquatic Life and Aquatic-Dependent Wildlife Selenium Water Quality Criterion for Freshwaters of California	ECCC recommends that precipitation and/or changes to the amount of expected precipitation (i.e., climate change) in the Elk Valley be considered when modelling the degree to which selenium is expected to seep from waste rock piles.
ECCC-IR-05	5(1)(a)(iii) Migratory Birds	6.1.6. Migratory Birds and their Habitat: Exposure to relevant contaminants of concern (see section 6.1.2) based on data from existing sources.	Chapter 22 – Human and Ecological Health Assessment; Section 22.5.3 Mitigation Measures; page 22-33	Ecological health effects were predicted at various assessment nodes throughout the Local Study Area (LSA) and Regional Study Area (RSA). For surface water quality, these nodes are situated at different locations within various watercourses surrounding the Project (e.g. Grave Creek, Alexander Creek, etc). Water management ponds may pose a health risk to fish and migratory birds, since they contain mine contact water with higher concentrations of contaminants than nearby natural waterbodies; however, wildlife exposure to contaminants, such as selenium, in water management ponds do not appear to be included in the ecological health risk assessment.	ECCC recommends that the EIS/A include: a) rationale as to why the ecological risk assessment for wildlife exposure to contaminants, such as selenium, was not completed for Project-related water management pond(s); and b) a description of mitigation measures that will be implemented to limit migratory birds exposure to water management ponds that may contain elevated concentrations of selenium.
ECCC-IR-06	*Species at Risk Act*	6.1.7 Species at Risk	15.6.3.3.1 Bat Community – Mitigation Measures	Mitigation measures for increased mortality risk to at-risk bats include that, if an active roost site is identified, the tree will not be felled and a buffer zone will be maintained during the maternity season. It is unclear how roost sites are to be identified, and whether the Proponent will utilize active capture surveys and telemetry work to track back to roosts or take more of an incidental reporting approach for bats and bat tree roosts. ECCC notes there is an extremely low chance of identifying tree roosts if no surveys are performed.	ECCC recommends that the EIS/A describe how roost sites will be identified in order to mitigate impacts to at-risk bats species.
ECCC-IR-07	5(1)(a)(iii) Migratory Birds *Species at Risk Act*	6.1.6 Migratory Birds and their Habitat 6.1.7 Species at Risk	15.7.3 Bird Community - Potential Effects Assessment 15.6 Bat Community (Table 15.6-4 Potential Effects on At-Risk Bats)	ECCC notes several deficiencies in the assessment of effects of light on migratory birds and bats, including: • Light attraction by nocturnal migrants (due to nighttime floodlighting of the Project area for nocturnal mining activities) is not considered. • While some light management methods are outlined, including shielding of lights and other considerations to reduce visual impact to humans and to reduce skyglow, significant horizontal light trespass visible to nocturnal migrants passing along the western ridge is predicted, which can create conditions for light attraction, disorientation, circling and mortality. • Other light management mitigations outlined are non-specific (e.g., “directed lighting where possible”), and may not address significant potential for large scale mortalities of nocturnally migrating birds.	ECCC recommends that the EIS/A include additional information on the potential effects of artificial lighting at night, in order to adequately characterize Project effects on migratory birds and bats.

				• Table 15.6-4 briefly mentions lighting in the increased mortality risk for bats but in the narrative section below it there is also no mention of lighting, specifically artificial light at night (ALAN), impacts on bats in foraging or movements (summer or autumn/winter).	
ECCC-IR-08	5(1)(a)(iii) Migratory Birds *Species at Risk Act*	6.1.6 Migratory Birds and their Habitat 6.1.7 Species at Risk	15.7 Bird Community (Table 15.7-20 Potential Effects on Bird VCs) 15.6 Bat Community (Table 15.6-4 Potential Effects on At-Risk Bats)	The EIS/A does not describe changes to insect community structure or biomass reduction from contaminants and changes to aquatic ecosystems, which could impact forage availability for insectivorous bats and birds. ECCC notes that damage to aquatic insect habitat and populations may have adverse effects on a range of insectivorous birds in the region, including Olive-sided Flycatcher, Black Swift and Common Nighthawk. Further, Table 15.6-4 identifies potential Project impacts to bats from changes to prey availability resulting from the loss or degradation of native vegetation, but not from contaminants.	ECCC recommends that the EIS/A include a description of potential effects on forage availability for insectivorous birds and bats resulting from Project-related changes to insect communities and aquatic ecosystems.
ECCC-IR-09	*Species at Risk Act*	6.1.7 Species at Risk	Appendix 15 C, section 1.2.5.14 Bat Modeling	Little information exists on the habitat preferences and use of bat species in the study area to build extensive quantitative habitat models. However, the bat habitat suitability modelling should be paired with the acoustic survey data to help reduce uncertainty. Validation of the bat habitat suitability model using data collected via acoustic and live capture surveys can help to assess overlap in the High ranking habitat using different approaches and build confidence in the predictive ability of the habitat model. This is especially important since the model informs the predictions of habitat loss and degradation.	ECCC recommends assessing the performance of (i.e. validating) the bat habitat suitability model using data collected via acoustic and live capture surveys.
ECCC-IR-10	5(1)(a)(iii) Migratory Birds *Species at Risk Act*	6.1.6 Migratory Birds and their Habitat 6.1.7 Species at Risk	15.7.3.3.3 Bird Community – Mitigation Measures for Increased Mortality Risk Section 15.8.3.3.2- Mitigation Measures for Increased Mortality Risk 33.4.1.13 Wildlife Management and Monitoring Plan	The EIS/A indicates that all clearing of vegetation will take place outside of the migratory bird breeding season. It is unclear whether this includes road-side brush clearing, which will be regularly mowed/brushed to maintain visibility of wildlife and reduce wildlife-vehicle collisions but may also pose a mortality risk for amphibians, including species at risk such as western toad and Columbia spotted frog.	ECCC recommends that the EIS/A describe the timing windows for road-side brush clearing, as well as the mitigation measures that will be implemented to reduce the mortality of amphibian species at risk from this maintenance activity.
ECCC-IR-11	5(1)(a)(iii) Migratory Birds	6.1.6 Migratory Birds and their Habitat	15.7.3.3.3 Bird Community – Mitigation measures for Increased Mortality Risk	Mitigation measures such as reducing speed limits, when limits are enforced, can ameliorate vehicle collision rates; however, avian mortality from vehicle collisions resulting from increased traffic related to the Project cannot be fully mitigated. Further, some bird species at risk in the area, such as Common Nighthawk and Evening Grosbeak are particularly susceptible to vehicle collisions. As such, ECCC is of the view that even after proposed mitigation measures are implemented, the potential remains for residual effects of the Project on increased mortality for bird VCs. Further, collisions between birds and glass that is part of structures may be a risk associated with the Project. Mitigation for glass collisions should include the addition of tightly spaced high contrast markers on surface 1 of glazing.	ECCC recommends that the EIS/A clarify the mortality reduction potential of their proposed mitigation measures, and this information be used to characterize residual effects to migratory birds from vehicle collisions and glass structures that remain after these mitigation measures are implemented.
ECCC-IR-12	5(1)(a)(iii) Migratory Birds *Species at Risk Act*	6.1.6 Migratory Birds and their Habitat 6.1.7 Species at Risk	21.4.2.3.7 Accidents and Malfunctions Assessment – Characterization of Residual Effects – Wildlife	Page 21-16 of the EIS/A states, "*habitat and food availability are predicted to increase following completion of spill response efforts and restoration activities to re-establish vegetation communities within the area affected by a release, over time*." ECCC notes that, depending on the habitat and/or food type, and the nature of the restoration work, increased habitat and food availability could take decades to achieve meaningful functional recovery.	ECCC recommends that references and rationale be provided to substantiate this claim of habitat and food availability increase following completion of post-spill restoration activities, and that this section be updated to include details on timelines for vegetation re-establishment.
ECCC-IR-13	*Species at Risk Act*	6.1.7 Species at Risk	15.5.2.2 Carnivore Community –	ECCC notes a discrepancy between Table 15.5-9, which indicates Grizzly Bear GPS collaring survey dates occurred from 2003-2008, and the description on page 15-175, which indicates the surveys were conducted from 2003-2019. Additional details on methods for ground transect surveys (depictured in Figure 15.5-) are also lacking. ECCC	ECCC recommends that the EIS/A clarify the exact dates that grizzly bear collaring occurred, and whether collaring took place between 2003 and 2008 or 2003 and 2019.

			Existing Conditions – Baseline Programs	requires this information to understand the reliability of the baseline data used to inform the effects assessment for the Project.	ECCC also recommends information be provided on the type of methods used for the ground transect surveys, and justification for why that method was chosen.
ECCC-IR-14	*Species at Risk Act*	6.1.7 Species at Risk	15.5.2.2.2 Carnivore Community – Existing Conditions – Baseline Programs	Page 15- 175 of the EIS/A states, "*Winter den sites for grizzly bears were also determined from GPS location data during November to April. Den site locations were inferred based on clustering of GPS location data during the expected denning period (Apps and Lamb, 2019)*" and "*a grizzly bear den was incidentally observed in the avalanche chute directly west of Crown Mountain during July 2018. Baseline surveys showed evidence of breeding females throughout the Terrestrial LSA*". Further information, including a map indicating the locations of observed grizzly bear dens and inferred den locations, is needed to understand interactions with Project components and activities, and assess Project effects.	ECCC recommends that the EIS/A include a description and map of the locations of the observed grizzly bear den and the inferred den locations in relation to the Project footprint, LSA, and RSA.
ECCC-IR-15	*Species at Risk Act*	6.1.7 Species at Risk	15.5.2.2.2 Carnivore Community – Existing Conditions – Baseline Programs	Figure 15.5-7 indicates that a number of American badger observations occurred in the area of proposed rail loop and roadways around the western section of Grave Creek Road. ECCC notes that the western edge of the terrestrial LSA abuts the intersection of Grave Creek Road but does not appear to include the Lower Elk Valley Road. Given the increased in road traffic for the Project, potential effects on carnivore VCs may occur along the Lower Elk Valley Road due to vehicle collisions and other Project interactions.	ECCC recommends that the terrestrial LSA be expanded to include the Lower Elk Valley Road, and potential effects to carnivore VCs in this area be assessed (including road mortality from potential vehicle collisions).
ECCC-IR-16	*Species at Risk Act*	6.1.7 Species at Risk	15.5.2.3.1 Carnivore Community – Existing Conditions – Modelling	A high number (i.e., 40-60) of environmental predictor variables were used in predictive habitat suitability modelling for the carnivore VCs. ECCC notes that complicated models with too many variables can be difficult to interpret and may perform poorly.	ECCC recommends that the EIS/A include a description of the sample size that was used to run these habitat suitability models, as well as evidence that would rule out the possibility of overfitting or spurious correlations.
ECCC-IR-17	*Species at Risk Act*	6.1.7 Species at Risk	15.5.3.2.4 Carnivore Community – Project Effects Assessment – Transboundary Effects	Page 15-217 of the EIS/A states, "*Grizzly bear, wolverine, and Canada lynx are highly mobile and wide-ranging animals. It is likely that individuals present in the Terrestrial LSA make seasonal or occasional movements into Alberta and possibly the U.S.A and into federal lands located within the Grizzly Bear and Terrestrial RSAs…Residual effects to carnivore VCs (if present) have the potential to be considered transboundary effects with Alberta and U.S.A and on federal lands*." Figures depicting the results of the habitat suitability models do not include results within the RSA, despite the importance of understanding the habitat types surrounding the Project and the full effects on habitat loss and connectivity regarding transboundary effects.	ECCC recommends that the EIS/A include details on how transboundary effects to carnivore VCs were assessed, including: • maps; • methodologies; • results of the analysis; and • a description of how these effects were considered in the significance determination for Project effects on grizzly bear movement and connectivity.
ECCC-IR-18	*Species at Risk Act*	6.1.7 Species at Risk	15.5.2.3.2 Carnivore Community – Existing Conditions – Modelling	Spring and summer habitat suitability for American badger is depicted in Figure 15.5-16, and Table 15.5-22 describes habitat suitability for American badger. It is unclear if Table 15.5-22 includes year-round habitat or only spring and summer. As described in the federal Recovery Strategy for the American Badger *jeffersonii* subspecies (*Taxidea taxus jeffersonii*) Western population and Eastern population in Canada [Proposed] (ECCC 2021), critical habitat is comprised of two subtypes: safe movement critical habitat that is necessary to support movement activities to sustain all other life functions, and core critical habitat that is necessary to support feeding/foraging and denning functions in addition to safe movement. <u>Reference:</u> Environment and Climate Change Canada. 2021. Recovery Strategy for the American Badger *jeffersonii* subspecies (*Taxidea taxus jeffersonii*) Western population and Eastern population in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. 2 parts, 20 pp. + 36 pp. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/american-badger-west-east-proposed-2021.html#toc1	ECCC recommends that Table 15.5-22 describes year-round habitat for American badger, including information on winter and fall habitat, as well as core and safe movement critical habitat.
ECCC-IR-19	*Species at Risk Act*	6.1.7 Species at Risk	15.5.3.2.1 Carnivore Community – Project Effects Assessment – Project Interactions	Table 15.5-26 includes mention of "*avalanche control*", however, further details are not provided elsewhere in Chapter 15. ECCC notes avalanche control with explosives may pose a serious threat of disturbance and risk of mortality to denning grizzly bears should it occur in proximity to denning grizzly bear or suitable denning habitat.	ECCC recommends that the EIS/A include information on the avalanche control work to be conducted for the Project, including type, location, frequency and methods, as well as the mitigation measures that will be used to prevent harm to grizzly bears and suitable denning habitat.

ECCC-IR-20	*Species at Risk Act*	6.1.7 Species at Risk	15.5.3.3.2 Carnivore Community – Project Effects Assessment – Mitigation Measures for Sensory Disturbance	Page 15-220 of the EIS/A states that mitigation to reduce sensory disturbance includes clearing blasting areas of terrestrial wildlife, which ECCC notes may include species at risk.	ECCC recommends that the EIS/A include additional information on how terrestrial wildlife will be cleared from blasting areas in a manner that does not harm species at risk, including details on the procedures that will take place to clear wildlife and which species will be targeted for clearing. Potential impacts to species at risk from these activities should be captured in the effects assessments for relevant VCs.
ECCC-IR-21	*Species at Risk Act*	6.1.7 Species at Risk	15.5.3.3.3 Carnivore Community – Project Effects Assessment – Mitigation Measures for Disruption to Movement	Page 15-221 of the EIS/A states, "*the conveyor underpasses are expected to allow passage of carnivore VCs beneath the conveyor; however, the degree of use is unknown. This mitigation is predicted to have moderate effectiveness with moderate uncertainty*". Furthermore, Figure 15.5-13 shows very high, high, and moderate suitability fall and winter, and patches of high suitability spring and summer, grizzly bear habitat surrounding Grave Creek Road. Grizzly bear occurrences are also confirmed along Grave Creek Road, as shown in Figure 15.5-5. These results indicate that Grave Creek Road is a high use movement corridor, and increased road traffic as a result of the Project could increase the risk of mortality and reduce movement and connectivity.	ECCC recommends follow-up monitoring and adaptive management plans be implemented to increase certainty in the effectiveness of the conveyor underpasses. These plans should be detailed in the EIS/A, including any additional mitigation measures that may be required. ECCC also recommends that the EIS/A include information on whether culverts and wildlife underpasses were considered at other known wildlife crossing areas, such as Grave Creek Road, and the justification for not implementing such measures along service corridors and haul roads in addition to those proposed below the conveyor.
ECCC-IR-22	*Species at Risk Act*	6.1.7 Species at Risk	15.5.3.3.4 Carnivore Community – Project Effects Assessment – Mitigation Measures for Increased Mortality Risk	The EIS/A describes measures to mitigate the impacts of increased mortality risk on carnivore VCs, including: • to, "*conduct den surveys in high potential denning habitat for grizzly bear and American badger to determine whether active dens are present and, if so, develop management strategies to avoid known active dens during vegetation removal and clearing";* and • that "*clearing, grubbing, and construction activities will be conducted in such a manner that if carnivores are present, there is escape*". No further details on methods are provided.	ECCC recommends that information be provided on: • the type of grizzly bear and American badger den survey methods that will be used; • the timing of when the den surveys will be conducted; • the methods for clearing, grubbing and construction activities; and • details on how carnivore escape will be ensured.
ECCC-IR-23	*Species at Risk Act*	6.1.7 Species at Risk	15.5.3.3.4 Carnivore Community – Mitigation Measures for Increased Mortality Risk	ECCC notes that mitigation measures to prevent hunting and poaching are not included in the section describing mitigation measures for increased risk of mortality of carnivore VCs.	ECCC recommends that Section 15.5.3.3.4 of the EIS/A describe how impacts from increased hunting will be addressed and mitigated.
ECCC-IR-24	*Species at Risk Act*	6.1.7 Species at Risk	15.5.3.4.2 Carnivore Community – Characterization of Residual Effects, Significance, Likelihood, and Confidence 15.8.3.4.2 Amphibian Community – Potential Residual Effects Assessment	Page 15-236 of the EIS/A states, "*even with the traffic control mitigations described in Section 15.5.3.3.4, vehicle collisions with grizzly bear may still occur…Further mitigations will be implemented to further minimize the risk of collision if required*". Similarly, the EIS/A also states, "*if areas with regular western toad movements are identified, then further mitigation measures will be implemented…*" ECCC notes that information and details on these additional mitigation measures are required to understand whether they will be effective in mitigating Project effects on grizzly bears and western toad.	ECCC recommends that the EIS/A describe feasible mitigation measures that would be implemented should there be a need to further mitigate collision risks for grizzly bears or effects on western toad. Furthermore, ECCC recommends that the Proponent consider implementing these additional mitigation measures as part of the Project plan, if they may help to mitigate potential environmental effects of the Project.
ECCC-IR-25	*Species at Risk Act*	6.1.7 Species at Risk	15.5.3.4.3 Carnivore Community – Characterization of Residual Effects, Significance,	Page 15- 246 of the EIS/A states, "*potential effects arising from vibration, light, dust, and human presence would be expected to be less than those arising from noise*", and that the context for effects of sensory disturbance is categorized as high because "*American badger has high resilience to sensory disturbance and will adapt to effects*." No rationale or evidence is provided to substantiate these statements.	ECCC recommends that rationale be provided to justify the statement that American badger are resilient to sensory disturbance, including any references or studies that show that American badger are not impacted by noise and vibration.

			Likelihood, and Confidence	In addition, it is unclear why the nighttime threshold for noise disturbance is lower than the daytime threshold, and whether seasonality or life history considered (e.g. hibernation, maternity periods) in the sensory disturbance effects assessment.	ECCC also recommends details be provided on the nighttime threshold for noise disturbance, and on how seasonality and life history were considered in the sensory disturbance effects assessment.
ECCC-IR-26	*Species at Risk Act*	6.1.7 Species at Risk	15.5.4.4.1 Carnivore Community – Potential Residual Cumulative Effects Assessment Methods	Table 15.5-39 of the EIS/A categorizes "Natural Resources Extraction – Mining (past)" as "*1- projects or activities have been or will be carried out and are not hypothetical",* but did not carry it forward to the cumulative effects assessment because it occurred in the past. ECCC notes that impacts from past mining activities can have lasting effects upon the landscape for decades and ecosystems may take a very long time to recover to their former state. Table 15.5-39 also characterizes Recreation and Tourism as "*1- projects or activities have been or will be carried out and are not hypothetical"*, but did not carry them forward to the cumulative effects assessment because the effects are expected to be "*absent*" or "*minimal*". ECCC further notes that effects of hunting and poaching are not included in Table 15.5-39.	ECCC recommends that physical activities related to past mining operations, including clearing and other impacts to habitats and ecosystems, be closely evaluated to understand whether they may contribute to cumulative effects to VCs for the Project. Further rationale should be provided to justify the exclusion of these activities from the cumulative effects assessment and demonstrate the impacts of the past mining activities are no longer in effect. ECCC also recommends that hunting be included in the list of Project activities likely to impact carnivore VC's. Alternatively, justification may be provided to demonstrate that hunting has been considered under Recreation and Tourism or that hunting will not result in adverse effects to carnivore VCs.
ECCC-IR-27	*Species at Risk Act*	6.1.7 Species at Risk	15.5.4.4.2 Carnivore Community – Potential Residual Cumulative Effects	Regarding the magnitude of the effect of grizzly bear habitat loss, ECCC notes that change in grizzly bear habitat in the RSA is predicted to be 3% in high quality fall habitat and 4% in high quality summer habitat; though the magnitude of the effect was characterized as low. ECCC also notes that the magnitude for effects of habitat loss for American badger (6.8% loss of year-round habitat) was assessed as moderate. ECCC further notes that, although the Project's contribution to these cumulative losses is low, the cumulative effects assessment should consider the cumulative effects on the VC as a whole, in order to align with the Impact Assessment Agency of Canada's *Operational Policy Statement on Assessment Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* [accessed from https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/assessing-cumulative-environmental-effects-under-canadian-environmental-assessment-act-2012.html] which states "*An EA must consider the significance of any cumulative environmental effects that are likely to result from a designated project in combination with other physical activities, taking into account the implementation of mitigation measures*".	ECCC recommends that the EIS/A include information on how the magnitude of the effect is derived, including the quantitative thresholds that were used to determine what amount of habitat loss will have a biologically significant impact on a species' ability to persist in the altered landscape, as losses of 3-4% may be ecologically significant depending on the species needs and existing conditions. ECCC recommends the cumulative effects on grizzly bear be assessed in their entirety (i.e., not reduced to the Project's contribution to the cumulative effect), and that the characterization of the magnitude of loss of grizzly bear habitat be reconsidered in light of spring, summer and fall habitat loss.
ECCC-IR-28	*Species at Risk Act*	6.1.7 Species at Risk	15.5.3.4.2 Carnivore Community – Characterization of Residual Effects, Significance, Likelihood, and Confidence Table 15.5-28	Grizzly bear may avoid certain areas where sensory disturbance or human presence is high, resulting in functional loss of habitat but information on indirect effects is missing from the habitat loss and degradation effects assessment. Furthermore, the EIS/A assessed the magnitude of grizzly bear habitat loss and degradation as low but only sites a loss of 3.7% high-quality fall habitat in the LSA and does not appear to consider the combined effects of loss of fall (3.7%), spring (3.3%), and summer (2.2%) habitat.	ECCC recommends that the EIS/A include information on how indirect effects of functional habitat loss were considered in the assessment of habitat loss to grizzly bear, particularly in the LSA which includes high quality fall (6,195 ha), winter (3,225 ha), spring (3,863 ha), and summer (6,481 ha) habitat. ECCC also recommends that the effects assessment for grizzly bear habitat loss and degradation consider the combined effects of fall, spring and summer habitat in the significance determination for magnitude of effects.
ECCC-IR-29	*Species at Risk Act*	6.1.7 Species at Risk	15.5.4.4.2 Carnivore Community – Potential Residual Cumulative Effects	Page 15-286 of the EIS/A states, "*the change in road density between the Base Case and Future Case can be used as an index that reflects the degree to which the risk of mortality may change. Road density for the Base Case is 1.7 km/km^2 and estimated to be 1.4 km/km^2 in the Future Case, a decline of 18%.*" The magnitude of this effect was assessed as negligible because "*grizzly bear mortalities from vehicle collisions and hunter access are expected to decline due to a decline in road density in the Grizzly Bear RSA and are expected to be uncommon*." Rationale for the estimations of road density for the base case and future case could not be located in the EIS/A. ECCC also notes that the predicted linear feature density estimate exceeds the recommended maximum road density threshold of 0.6 km/km^2 required to maintain grizzly bear habitat values (including security and movement; Proctor et al., 2020). This is particularly important in consideration of the increase in traffic along access roads from	ECCC recommends that the rationale for the estimations of road density (or the location in the EIS/A this information can be located) be clearly described in Section 15.5.4.4.2. ECCC also recommends that the characterization of magnitude for cumulative effects of mortality risk be reassessed, given exceedance of the maximum road density threshold for grizzly bear habitat values

				the rail loadout to the respective plant and storage areas is estimated to be 140 round trips per day and 60% of these vehicle trips will be haul trucks. <u>Reference:</u> Proctor, M.F., B.N. McLellan, G.B. Stenhouse, G. Mowat, C.T. Lamb, M.S. Boyce. Effects of roads and motorized human access on grizzly bear populations in British Columbia and Alberta, Canada. Ursus, 2019 (30e2) (2020), pp. 16-39.	
ECCC-IR-30	5(1)(a)(iii) Migratory Birds *Species at Risk Act*	6.1.6 Migratory Birds and their Habitat 6.1.7 Species at Risk	Section 13.6.7 – Project Effects on Wetland Ecosystems	ECCC notes that there appears to be some inconsistencies in the totals provided for loss of wetland habitat in the text of Section 13.6.7 and the information contained in Table 13.6-17. For example, Section 13.6.7 states, "*A total of 0.69 ha of wetlands will be removed, consisting of 0.41 ha of marsh wetland (Wm01 and Wm16 site associations) and 0.52 ha of shallow water wetland (Ww and Ww Yellow pond-lily Type; Table 13.6-17)".*	ECCC recommends reviewing and revising the totals for loss of wetland habitat and confirming the total areas of wetland habitat predicted to be impacted by the Project.
ECCC-IR-31	5(1)(a)(iii) Migratory Birds *Species at Risk Act*	6.1.6 Migratory Birds and their Habitat 6.1.7 Species at Risk	Chapter 13 Landscapes and Ecosystems Assessment Chapter 15 Wildlife and Wildlife Habitats Assessment General Comment	The cumulative effects assessments for vegetation and wildlife VCs do not provide adequate details and information to understand the Project's contribution to cumulative effects in the region, nor do they always align with the Impact Assessment Agency of Canada's *Operational Policy Statement on Assessment Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* [accessed from https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/assessing-cumulative-environmental-effects-under-canadian-environmental-assessment-act-2012.html]. For example: • The EIS/A identified significant residual effects to old growth and mature forests, yet this result was not carried forward in the cumulative effects assessment and the EIS/A determined no significant cumulative effects for old growth and mature forests. • For many vegetation and wildlife VCs, including whitebark pine and grizzly bear (see ECCC-IR-27), cumulative effects are assessed for the Project's contribution to cumulative effects, which does not align the Agency's Operational Policy Statement which states "*An EA must consider the significance of any cumulative environmental effects that are likely to result from a designated project in combination with other physical activities, taking into account the implementation of mitigation measures*".	ECCC recommends that the "*Operational Policy Statement on Assessment Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012"* be consulted and its principles applied to the cumulative effects assessments for vegetation and wildlife VCs.
ECCC-IR-32	*Species at Risk Act*	6.1.7 Species at Risk	33.4.1.13.6 Wildlife Management and Monitoring Plan Table 33.4-44	ECCC notes that the guidelines and buffers listed in Table 33.4-44 are not referenced in the relevant sections of the EIS/A/A (i.e., Chapter 15). If these guidelines are intended to be mitigation measures for particular VCs, they should be included in relevant mitigation measures tables and text in the EIS/A/A, as applicable.	ECCC recommends that the EIS/A/A describe how the guidelines and buffers listed in Table 33.4-44 are considered in the effects assessment for the Project. If they are intended to be implemented as mitigation measures, the mitigation measures tables for relevant VCs should be updated accordingly.
ECCC-IR-33	5(1)(a)(iii) Migratory Birds	6.1.6 Migratory Birds and their Habitat	Chapter 15 Wildlife and Wildlife Habitats Assessment Appendix 15E Bird Community Baseline Report	On July 28, 2023, ECCC provided early technical advice to the Impact Assessment Agency of Canada (IAAC) regarding the Proponent's methods for woodpecker surveys (provided by the Proponent to IAAC on June 23, 2023); however, this information has not been incorporated into the bird community baseline survey appendix in the EIS/A/A. ECCC's July 28, 2023 advice is as follows: 1. In their survey methods description, the Proponent states that they will conduct call playback surveys for all three species-at-risk woodpeckers (i.e., Wilson's sapsucker, Lewis's woodpecker and pileated woodpecker). However, ECCC notes that other woodpecker species (e.g., Northern flicker, hairy woodpecker, American three-toed and red-naped sapsucker) are also commonly found in the Elk Valley. ECCC recommends that these species also be surveyed in order to inform the assessment of impacts of the Project on woodpeckers. 2. BC's RISC protocol, Inventory Methods for Woodpeckers, recommends that call playback surveys occur during the pre-nesting or nesting period, when pileated woodpeckers begin to incubate eggs and are most territorial. ECCC notes that call playback surveys were conducted by the Proponent in June when pileated woodpecker may be entering the chick-rearing stage and recommends that call playback surveys occur earlier in mid to late May. ECCC will evaluate the data during technical review to assess whether the late timing of the call playback surveys may have implications for the reliability of the survey results. ECCC	ECCC recommends that the June 23, 2023 information from the Proponent on methods for woodpecker baseline surveys, as well as ECCC's Jul 28, 2023 technical advice be incorporated into the EIS/A/A.

				recommends that any future call playback surveys for pileated woodpeckers be conducted during the pre-nesting or nesting period. 3. ECCC notes that it is difficult to evaluate the survey designs that are described without a visual depiction (e.g., map or figure detailing the location of transects, survey station locations, and the types of habitat found in the LSA and RSA) and therefore cannot comment on these features. ECCC expects this information to be provided during technical review and may provide further comments on survey design at that time. 4. Additional information regarding the pileated woodpecker cavity survey protocol is required to better understand whether adequate coverage of the area will be achieved. Pileated woodpecker nests are not often located by simply walking a transect, which may severely underestimate the number of cavities and nests present. Instead, cues such as detection of adults during call playbacks and following birds away from transects are more likely to result in the location of a nest. To better inform a targeted approach for pileated woodpecker nesting cavity surveys, ECCC recommends that the data collected during call playback surveys be used in conjunction with an analysis of the distribution of the vegetation within the forest stands to focus survey effort on areas where pileated woodpecker are more likely to be nesting. ECCC recommends that these methods be employed for any additional pileated woodpecker cavity surveys conducted in the future. <u>Reference:</u> BC Ministry of Environment, Land and Parks (1999). Inventory methods for woodpeckers. Prepared for the Terrestrial Ecosystem Task Force, Resources Inventory Committee. https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/woodml20.pdf	
ECCC-IR-34	*Species at Risk Act*	6.1.7 Species at Risk	14.3.3.4.2 Vegetation Assessment – Whitebark Pine Technical Boundaries	ECCC notes some important parameters (e.g., occurrence, stand density, tree health, etc.) are not included in the baseline data and technical boundaries. Without more detailed information on these parameters, ECCC is unable to assess potential impacts to whitebark pine individuals and critical habitat from the Project, especially if using a before-after-control-impact (BACI) assessment.	ECCC recommends that information on occurrence, stand density and tree health be provided in the EIS/A/A, in order to assess Project effects on whitebark pine stands and determine appropriate mitigation measures to be implemented.
ECCC-IR-35	*Species at Risk Act*	6.1.7 Species at Risk	14.3.3.4.2 Vegetation Assessment – Whitebark Pine Technical Boundaries 14.6.5.3.2 Vegetation Assessment – Potential Residual Effects Assessment	Page 14-82 of the EIS/A/A states, "*given that field surveys used to ground truth vegetation resources were limited to the Landscapes and Ecosystems LSA… it is not necessarily technically feasible to extrapolate species occupancy or habitat suitability to the regional scale… Consequently, it is not feasible to predict the extent of populations and/or habitat of listed plant communities and species, including whitebark pine, in the Landscapes and Ecosystems RSA*." ECCC notes that whitebark pine surveys were only conducted in the LSA and despite limitations with extrapolation, no ground truthing or assessment of whitebark pine extent was conducted in the RSA.	ECCC recommends that the EIS/A/A describe the types of baseline data (e.g. desktop studies) used to establish the whitebark pine baseline for the RSA.
ECCC-IR-36	*Species at Risk Act*	6.1.7 Species at Risk	14.3.3.4.2 Vegetation Assessment – Whitebark Pine Technical Boundaries	Page 14-11 of the EIS/A/A states, "*the total area of overlap with whitebark pine habitat was interpolated by multiplying the total polygon area by the estimated proportion attributed to whitebark pine habitat site series. Although this method is reasonable for the quantification of potential effects associated with the Project, it may not accurately reflect the precise location and delineated extent of all areas of impact. Site-specific mitigation planning should be based on refined mapping conducted during the detailed design stage of development*." ECCC notes that details on mitigation measures are required in the effects assessment phase of the Project to accurately predict the effects of the Project on whitebark pine and to determine significance of residual effects.	ECCC recommends that refined site-specific mapping be conducted and incorporated into the EIS/A/A to better characterize residual and cumulative effects on whitebark pine in the Project footprint, LSA, and RSA.
ECCC-IR-37	*Species at Risk Act*	6.1.7 Species at Risk	14.6.5.1.3 Vegetation Assessment – Potential Effects on	Page 14-20 of the EIS/A states, "*Clark's Nutcracker plays an important role in seed dispersal, dispersing seeds up to a maximum of 36 km away from the seed source (Lorenz et al., 2011), which could include forests in Alberta and Montana. Given the exceptional dispersal distances of white pine blister rust spores and Clark's Nutcracker, there is potential for Project impacts to whitebark pine to occur in the adjacent jurisdictions of Alberta and Montana or on*	ECCC recommends the EIS/A/A include additional information to describe the potential transboundary effects of the Project on whitebark pine in Alberta, the US and on federal lands, including any applicable mitigation measures. ECCC also

			Whitebark Pine – Transboundary Effects	*federal lands located in B.C. and Alberta (refer to Chapter 1, Section 1.3.3 for a description of federal lands near the Project).*" However, page 14-74 states, *"although Clark's Nutcracker can disperse whitebark pine seeds up to a maximum of 36 km, there is an abundance of suitable habitat and existing populations of whitebark pine outside the Landscapes and Ecosystems LSA. Consequently, given the abundance of whitebark pine populations outside of the Landscapes and Ecosystems LSA, the influence of the Project in Alberta and on federal lands is considered to be negligible*." The EIS/A/A identifies a potential for the Project to impact whitebark pine in adjacent jurisdictions of Alberta, Montana, or on federal lands in British Columbia and Alberta however, these transboundary effects have not been sufficiently described in the EIS/A/A. In particular, the Project is located approximately 5 km west of the Alberta provincial border, which is well within the Clark's Nutcracker range for whitebark pine see dispersal. Insufficient information is provided in the EIS/A/A to characterize these transboundary effects or support the conclusion that these effects are "negligible".	recommends additional rationale be provided to support the conclusion that effects are "negligible", or this characterization be revised based on the new/additional information that will be provided by the Proponent.
ECCC-IR-38	*Species at Risk Act*	6.1.7 Species at Risk	14.5.1.3.1 Vegetation Assessment – Existing Conditions – Whitebark Pine Habitat Availability and Distribution 14.5.2.1.4 Vegetation Assessment – Existing Conditions – Whitebark Pine Habitat	Page 14-18 of the EIS/A/A states, "*High-quality whitebark pine habitat in the region consists of high elevation (i.e., above 1,750 m asl) open-canopy conditions with well- to rapidly-drained soils that are coarse-textured, rocky, and shallow over bedrock (ECCC, 2017)*" and page 14-30 states that TEM polygons were assessed within the elevational range of whitebark pine throughout the Landscapes and Ecosystems LSA to identify other potential critical habitat. The federal Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed] states, "*Whitebark Pine occurs in a diversity of forested ecosystems, predominantly in the upper montane and subalpine. The low-elevation extent of the species ranges from 1700 metres at the Canada-US border to as low as 765 metres at Morice Lake to 1600 metres in north-central BC (Ogilvie 1990, S. Haeussler pers. Comm. 2013, B. Jones pers. Comm. 2013). This elevation range may be highly variable due to Clark's Nutcrackers opportunistic caching on competition-free sites such as burns and rocky ridges, at higher and lower elevational limits*." Therefore, setting a firm cutoff of 1,750 m asl for high quality whitebark pine habitat does not align with the range identified in the Recovery Strategy, nor does it account for variability in the low-elevation extent of the species (e.g., 1,700 m at Canada-US border is an average elevation). ECCC notes that the Recovery Strategy does not employ an elevation cutoff due to the regional variability in the low-elevation extent of the species. <u>Reference:</u> Environment and Climate Change Canada. 2017. Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. Viii + 54 pp.	ECCC recommends that baseline and Project effects assessments for whitebark pine include suitable habitat areas below 1750 m asl, and include information on the maximum elevation that was used in the models to generate the TEM polygons shown in Section 14.5.2.2.2 and Table 14.5-3.
ECCC-IR-39	*Species at Risk Act*	6.1.7 Species at Risk	14.5.2.1.4 Vegetation Assessment – Existing Conditions – Whitebark Pine Critical Habitat	Page 14-29 of the EIS/A/A states, "*whitebark pine trees less than 1.3 m in height were recorded as seedlings and tallied but were not factored in the calculation of basal area per plot*." ECCC notes that Whitebark Pine can have varied growth forms, and no rationale is provided for the exclusion of seedlings from basal area calculations.	ECCC recommends supporting references be provided to justify the decision to define trees <1.3 m as seedlings, and rationale be provided for the exclusion of trees classified as seedlings from basal area calculations.
ECCC-IR-40	*Species at Risk Act*	6.1.7 Species at Risk	14.5.2.1.4 Vegetation Assessment – Existing Conditions – Whitebark Pine Critical Habitat Figure 14.5-4 Figure 14.5-9	Figure 14.5-4 shows whitebark pine sampling locations and whitebark pine critical habitat study areas, and Figure 14.5-9 depicts several types of whitebark pine critical habitat. It is unclear whether the yellow polygons in Figure 14.5-4 (critical habitat study area) correspond with mapped critical habitat polygons in the Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed][1]. For Figure 14.5-9, it is unclear whether the yellow critical habitat polygons correspond with seed dispersal habitat, how "Recovery/ Regeneration" critical habitat is defined in comparison to the definitions of critical habitat in the Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed][1], and what the relevance of the "Potential Whitebark Pine Seed" polygon is and how does it also overlap with the "Recovery/ Regeneration" critical habitat.	ECCC recommends that the EIS/A/A assess not only the polygons defined as potential critical habitat by the Proponent, but all critical habitat as outlined in the recovery strategy (i.e. from location and description of regeneration habitat in the Recovery Strategy "…*where landscape inventory polygons have a high density of Whitebark Pine (i.e., threshold level of greater than or equal to 2 m^2/ha basal area as averaged across the landscape inventory polygon), the entire landscape inventory polygon is identified as seed dispersal and regeneration habitat*…").

				Reference Environment and Climate Change Canada. 2017. Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. Viii + 54 pp.	ECCC also recommends that the EIS/A/A describe the different types of critical habitat shown in Figure 14.5-9.
ECCC-IR-41	*Species at Risk Act*	6.1.7 Species at Risk	14.5.2.2.4 Vegetation Assessment – Existing Conditions – Results – Whitebark Pine Habitat	Page 14-38 of the EIS/A/A states, "*Given that whitebark pine does not necessarily occupy the entire area of each TEM polygon, the total area of whitebark pine habitat likely presents an upper limit of maximum occupancy, offering a precautionary estimate of the extent within the Landscapes and Ecosystems LSA and Project footprint*." ECCC notes that it is ecologically impossible for whitebark pine to occupy the entire area of each TEM polygon. Habitat includes all the species' needs, therefore it is biologically inaccurate to assume a TEM polygon would include just the whitebark pine trees themselves.	ECCC recommends that habitat estimations for whitebark pine be updated to more accurately represent the habitat needs and requirements of the species.
ECCC-IR-42	*Species at Risk Act*	6.1.7 Species at Risk	14.5.2.2.4 Vegetation Assessment – Existing Conditions – Results – Whitebark Pine Habitat	Page 14-29 of the EIS/A/A states "*Whitebark pine produces mast cone crops at irregular intervals of 3-5 years; however, little to no cone production is common between mast years (ECCC, 2017)*", yet the EIS/A/A defines a reproductive tree as "*cone-bearing or >10cm DBH*". ECCC notes that it is possible for trees of <10 cm DBH to have reproductive capabilities. Assessing these individuals in only one year does not provide sufficient baseline data to present accurate numbers of mature trees, which reduces the confidence of subsequent effects assessments.	ECCC recommends that the values of DBH for cone-producing trees be provided to confirm whether >10 cm DBH is the correct cut-off for this determination.
ECCC-IR-43	*Species at Risk Act*	6.1.7 Species at Risk	14.5.2.2.4 Vegetation Assessment – Existing Conditions – Results – Whitebark Pine Habitat Table 14.5-10: Potential Extent of Critical Habitat	Table 14.5-10 identifies whitebark pine critical habitat by site type, however ECCC notes some inaccuracies in the classification of the critical habitat types. Critical habitat is classified as "Seed Dispersal and Recovery critical habitat" or "Regeneration critical habitat" in the Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed] (Environment Canada 2017) and has been misclassified in Table 14.5-10. Reference: Environment and Climate Change Canada. 2017. Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. Viii + 54 pp.	ECCC recommends that the EIS/A/A be updated to include the correct classification of whitebark pine critical habitat types and to ensure that these definitions are truly understood in the context of the EIS/A/A and effects assessments.
ECCC-IR-44	*Species at Risk Act*	6.1.7 Species at Risk	14.6.1.3 Vegetation Assessment – Thresholds for Determining Significance of Residual Effects – Whitebark Pine	A footnote on page 14-45 of the EIS/A/A states, "*A reduction in seed dispersal critical habitat would be "not significant" where replaced with an equivalent area of suitable recovery/regeneration habitat and sufficient seed dispersal habitat remains to maintain the potential for recovery/regeneration of whitebark pine*." ECCC notes that removing reproductively mature trees and/or core seed dispersal habitat will have an irreversible effect. Without mature trees from which to disperse seeds, regeneration habitat function will be compromised. Both types of critical habitat described in the Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed][1] are required to ensure persistence of whitebark pine over time. ECCC also notes that there is no explicit discussion elsewhere in the EIS/A/A about removal of mature cone-bearing or non-terminally affected individuals resulting in a permanent loss. Reference Environment and Climate Change Canada. 2017. Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. Viii + 54 pp.	ECCC recommends that the footnote on page 14-45 be revised to reflect the importance of both types of critical habitat for whitebark pine. ECCC also recommends that the EIS/A clearly describe when and where removal of individuals will occur.
ECCC-IR-45	*Species at Risk Act*	6.1.7 Species at Risk	14.6.5.1.1 Vegetation Assessment – Potential Effects on Whitebark Pine –	Page 14-73 of the EIS/A states, "*with successful implementation, the restoration of ecological conditions will reverse (at least in part) the loss of whitebark pine and associated habitat in the Project footprint*." Page 14-78 the EIS/A acknowledges that "*mitigation measures proposed to reduce potential effects to the mortality of and/or loss of habitat for whitebark pine are generally experimental, under ongoing development with little*	ECCC recommends that the EIS/A be updated to describe the uncertainty associated with the potential outcomes of restoration activities, and how this uncertainty is considered in the assessment of Project effects. ECCC also recommends that follow-up monitoring and adaptive management plans for whitebark pine detail how the effectiveness of restoration

			Mortality and/or Loss of Habitat	*demonstration on projects of similar context. Consequently, the associated effectiveness of the recommended measures for mitigation of mortality of and/or loss of habitat for whitebark pine is considered to be unknown*." ECCC notes that restoration cannot reverse the loss of seed dispersal critical habitat and, at best, only a small part of baseline ecological conditions will be 'reversed'. Once established, it takes 30-50 years for a tree to begin producing ones and 60-80 years to produce cones in a sizeable quantity, so it is unlikely the density requirements to achieve seed dispersal and recovery habitat, as per the Recovery Strategy, would occur within the Project lifetime. The Recovery Strategy also states, "*Ensuring trees that are cone-producing and/or putatively rust resistant are maintained on the landscape (in sufficient density to support continued distribution by Clark's Nutcracker, as described below) is paramount to species recovery*." See also ECCC-IR-44. <u>Reference</u> Environment and Climate Change Canada. 2017. Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. Viii + 54 pp.	activities will be monitored, and what additional mitigation measures could be implemented.
ECCC-IR-46	*Species at Risk Act*	6.1.7 Species at Risk	14.6.5.2.1 Vegetation Assessment – Potential Effects on Whitebark Pine – Mitigation Measures for Mortality and/or Loss of Habitat	Page 14-75 of the EIS/A states that a Whitebark Pine Salvage, Propagation and Restoration Plan is proposed as a component of the Ecological Restoration Plan (Chapter 33, Section 33.4.1.3), but ECCC notes that no such whitebark pine-specific plan is described further in Section 33.4.13.	ECCC recommends that the Whitebark Pine Salvage, Propagation and Restoration Plan, including the elements outlined on page 14-75- and 14-76, be included in the description of the Ecological Restoration Plan in Chapter 33.
ECCC-IR-47	*Species at Risk Act*	6.1.7 Species at Risk	14.7.6.2.1 Vegetation Assessment – Characterization of Residual Cumulative Effects – Whitebark Pine	Page 14-98 of the EIS/A states, "*although the potential critical habitat areas mapped by ECCC (2017) would equal as much as 9,508 ha within the Landscapes and Ecosystems LSA, surveys conducted for the Project refined the potential extent to be far less (i.e., 1,336 ha; Table 14.5-10)*". However, page 14-83 of the EIS/A states, "*the assessment may have underestimated the total extent of recovery/regeneration critical habitat with potential to be affected by the Project*." The EIS/A does not adequately describe the Proponent's methods for defining critical habitat, nor does it indicate whether they align with the critical habitat definitions in the Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed][1]. ECCC further notes that the Whitebark Pine Salvage and Restoration Plan described on page 14-75 mentions enhanced mapping for: • Seed dispersal critical habitat that will be lost due to construction of the Project; • Recovery/regeneration critical habitat with potential to be functionally lost due to loss of the seed dispersal critical habitat (i.e., areas of seed dispersal that are no longer located within 2 km of seed dispersal habitat); and • Critical habitat (both types) located within 100 m of the Project footprint that may be subject to impacts due to introduction of weeds, dust and/or spills of deleterious substances. <u>Reference:</u> Environment and Climate Change Canada. 2017. Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. Viii + 54 pp.	ECCC recommends that the EIS/A describe the methods used to define and determine critical habitat in order to ensure alignment with critical habitat definitions in the Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed][1] and to better understand the potential underestimation of critical habitat affected by the Project. ECCC also recommends that the EIS/A describe any additional mapping that will occur, when these surveys are planned to take place, and justification for a 100 m buffer around the Project footprint.
ECCC-IR-48	*Species at Risk Act*	6.1.7 Species at Risk	14.7.6.2.1 Vegetation Assessment – Characterization of	Page 14-98 of the EIS/A states, "*although as much as 1,176 ha of critical habitat proposed by ECCC (2017) is intersected by the Project footprint, Project-specific analysis confirmed that the actual extent will be closer to 802 ha, or less than 1% (i.e., 802 ha of 236,671 ha) of the total extent of potential whitebark pine critical habitat in the Landscapes and Ecosystems RSA*".	ECCC recommends that the EIS/A describe in detail the Project-specific analysis used to determine the extent of whitebark pine critical habitat for the Cumulative Effects Project Case, including the methods used in the analysis, and

			Residual Cumulative Effects – Whitebark Pine	The EIS/A does not adequately explain the Project-specific analysis used to determine the extent of whitebark pine critical habitat. ECCC also notes that page 14-101 of the EIS/A identifies "…*uncertainty in the confirmed extent of whitebark pine in the Landscapes and Ecosystems RSA*".	rationale as to why the actual extent of whitebark pine critical habitat loss is expected to be less than the extent of critical habitat proposed in the Recovery Strategy. ECCC also recommends that the EIS/A describe the noted uncertainty in the confirmed extent of whitebark pine in the RSA, in consideration of comment ECCC-IR-35 which notes a lack of baseline data in the RSA.
ECCC-IR-49	*Species at Risk Act*	6.1.7 Species at Risk	14.7.7 Vegetation Assessment – Summary of Cumulative Effects Assessment	Page 14-101 of the EIS/A characterizes the likelihood of residual cumulative effects to whitebark pine as high, however, the level of confidence in the of the significance prediction on mortality of whitebark pine and/or loss of habitat is characterized low, given uncertainty in the confirmed extent of whitebark pine in the Landscapes and Ecosystems RSA.	ECCC recommends that the EIS/A include additional rationale to reconcile the high likelihood yet low confidence in the residual cumulative effects assessment for whitebark pine.
ECCC-IR-50	5(1)(a)(i) Fish and Fish Habitat	6.6.2 Effects of the Environment on the Project – Climate Change	Chapter 3 Project Description Chapter 20 Effects of the Environment on the Project Appendix 20A Climate Change Impact Assessment	In Appendix 20A, climate model projections indicate that there may be changes in: (i) the intensity/frequency of occurrence of extreme short-duration precipitation events and (ii) drought frequency/extent in the Project area over the Project's lifetime. The EIS/A also indicates (Section 3.6) that the operational lifetime is 15 years but that the closure and post-closure activities will extend for an additional 17 years, such that the overall Project lifetime is roughly 34 years (i.e., into the late 2050s assuming a 2024/5 start). Chapter 20 and the supporting appendix discuss potential climate change hazards and Project sensitivities in an overall evaluation of risks posed to the Project by climate change. These are not broken down into the different phases of the Project and it is unclear how the climate change projections have been considered in some aspects of design. Although adaptation measures are listed, it is not clear if climate change has been considered in design of infrastructure. This is of particular concern for design elements that will remain in place over the post-closure period (such as water management infrastructure). As an example, the Proponent indicates that aspects of the sediment ponds will be based on fixed design values (e.g., the overflow spillways). When describing plans for the water management infrastructure after mine closure, they indicate that "*depending on potential selenium management requirements, portions of the existing water management system can be left in place for an extended period*" (Chapter 3, p.3-94). The length of this period is not specified. Regarding the potential implications of future drought in the Project area, the Proponent indicates that, *" … a risk interaction related to the sedimentation pond requires further assessment to determine if projected drought conditions may impact pond water levels which may result in insufficient dilution of mine affected water. Environmental compliance monitoring is expected to take place continuously throughout the project and mitigation measures will be implemented as necessary"* (Appendix 20-A, p. 15). It is unclear why this risk interaction was not evaluated more fully in Chapter 20 with the other climate hazards. <u>References for Consideration:</u> Bush, E. and Lemmen, D.S., editors (2019): Canada's Changing Climate Report; Government of Canada, Ottawa, ON. 444 p. https://changingclimate.ca/CCCR2019/ Canadian Standards Association 2019. Technical Guide CSA PLUS 4013-12: Development, interpretation, and use of rainfall intensity-duration-frequency (IDF) information: Guideline for Canadian water resources practitioners. ECCC (2022). Draft Technical guide related to the Strategic Assessment of Climate Change: Assessing Climate Change Resilience. https://www.strategicassessmentclimatechange.ca/28896/widgets/117114/documents/77106	ECCC recommends that the EIS/A clarify how climate change has been or will be considered in the project design and management, including: a) Where design values for long-lived project infrastructure (that are sensitive to extreme precipitation, e.g., water management infrastructure) are derived from historical climate data, explain how climate change has been or will be considered. b) Regarding the risk interaction related to the sedimentation pond, describe the risks posed, the time period they are relevant, and any additional assessment that may be required (e.g., timing, methods, and how it will inform planning, design and management and adaptation measures).
ECCC-IR-51	5(1)(a)(i) Fish and Fish Habitat	6.1.2 Geology and Geochemistry 6.1.4 Groundwater and Surface Water	Chapter 3 Project Description Appendix 3C Denitrification and	Insufficient evidence is provided in support of the claimed validity/ effectiveness of the "layer cake" mine rock storage facility (MRSF) as the primary mitigation measure for managing selenium and nitrate leaching from mine waste rock. The Project is expected to produce around 733 million tonnes of mine waste rock, which will be stored in the MRSF.	ECCC recommends that: a) the Proponent conduct further laboratory experiments and field-based pilot studies to

		6.2.2 Changes to Groundwater and Surface Water	Selenium Reduction in Unsaturated Rock and Coal Reject Chapter 11 Surface Water Quality Assessment Appendix 11C Geochemical Baseline Appendix 11E Water Mitigation Technology Readiness Review Appendix 11F Water Quality Prediction Model	Geochemical testing of the mine waste rock, considered alongside extensive data from comparable coal mines in the region, suggests that without proper management, effluent from the MRSF could impact downstream water quality and result in adverse effects to fish. The EIS/A proposes to apply a novel "layer cake" approach in the construction of the MRSF ("layer cake" MRSF) as the primary mitigation measure for mine waste rock management and its effluent chemistry. This novel approach is based solely on the preliminary findings of a single laboratory column test study (i.e., Appendix 3-C), without support from field-based pilot studies. Despite claims in Appendix 11-E that this "layer cake" approach has been proven effective at other mine sites, no evidence or examples of such cases are provided. Furthermore, the EIS/A does not offer alternative mitigation measures such as water treatment or contingency plans for managing mine waste rock and its effluent. Geochemical source terms applied in the water quality model for effluent from the proposed "layer cake" MRSF are presented in Table 25 and Table 26 of Appendix 11-F. After mine year 4, the 50th percentile source terms (P50) for selenium range from 0.0222 mg/L to 0.0633 mg/L and nitrate is at 0.500 mg/L under a successful "layer cake" MRSF scenario, compared to selenium at 0.215 mg/L to 0.397 mg/L and nitrate at 3.18 mg/L to 39.0 mg/L under a failure scenario. This indicates an approximately 10-20 fold increase of selenium leaching, and 10-80 fold increase of nitrate leaching should the MRSF fail. ECCC notes that while the "layer cake" MRSF failure scenario has been modelled, its potential impact on Valued Components has not been incorporated into the effects assessment for surface water quality and fish (see ECCC-IR-64). The EIS/A assumes that the substantial reductions in selenium and nitrate leaching observed in the laboratory column test study (Appendix 3-C) will translate directly to the full-scale proposed MRSF facility. Considering the substantial differences between the controlled laboratory conditions and the real-world application of the "layer cake" approach, it is overly optimistic to assume that the findings of the laboratory study can be directly applied to the natural environment without validation through field tests across different scales. Furthermore, the laboratory column test study (Appendix 3-C) itself exhibits several deficiencies that raise doubts on the validity of its results and conclusions: <u>Uncertainty regarding nitrate removal via microbial denitrification</u> The column tests designed to mimic the "layer cake" approach (Figure 2, Appendix 3-C) demonstrated successful nitrate removal when the groundwater (spiked with known quantities of selenate-Se and nitrate-N) flows through the coal reject column and then the waste rock column under various conditions (Figure 3, Appendix 3-C). Despite the wide range in the dissolved oxygen levels between different test runs (Table 3, Appendix 3-C), nitrate removal rate remained relatively unchanged in coal reject columns and similar in waste rock columns (Figure 3 and Table 4, Appendix 3-C). This may indicate that factors other than the proposed microbial denitrification might be primarily responsible for nitrate removal. While microbial denitrification can occur in the presence of oxygen, its efficiency is significantly influenced by oxygen concentrations. Oxygen outcompetes nitrate as an oxidant, thus the rate of nitrate removal should be inversely related to oxygen concentration in the column, if microbial denitrification were the primary mechanism for nitrate removal. Furthermore, the expected intermediate species of denitrification, such as nitrite and nitrous oxide, were not reported, raising questions on the design of this laboratory study. <u>Discrepancy in initial selenium concentration</u> Conflicting information is presented on the selenium concentration in groundwater used for the column tests. Section 2.4 of Appendix 3-C states "[*G]roundwater extracted from the "Mona Lisa" well was amended to an initial concentration of 10 mg/l nitrate-N and 0.2 mg/l selenate-Se*". Table 1 of Appendix 3-C also shows that the initial selenate-Se concentration was set at 0.2 mg/L for all the eight column tests. On the contrary, Section 4.3 of Appendix 3-C claims that "[I*]nfluent selenium concentration ranged between 0.372 and 0.381 mg/L in the coal reject columns.*" Note that the dissolved selenium concentration in groundwater extracted from the "Mona Lisa" well was listed as below the detection limit of 0.001 mg/L (Method E200.8) in Appendix B4 of Appendix 3-C.	demonstrate the validity and effectiveness of the "layer cake" approach; b) the residual effects assessment for water quality take into account the uncertainty in the predicted effectiveness of the MRSF. Potential effects to VCs resulting from MRSF failure should be clearly described in the EIS/A and reflected in the characterization of residual effects for each VC (e.g., Surface Water Quality, Groundwater Quality, Fish and Fish Habitat, etc.) (See also ECCC-IR-64); and c) the EIS/A include contingency plans for managing mine waste rock and its effluent that could be implemented if the MRSF is less effective than assumed in the EIS/A. Contingency plans should include proven mitigation measures that are feasible and can be immediately implemented to prevent the deterioration of water quality in the receiving environment from project discharges. Given the uncertainty related to MRSF effectiveness, the EIS/A should also assess the predicted effects of the Project with the contingency measures in place (See also ECCC-IR-83).

				The initial selenium concentration of the influent for column tests is unclear. This discrepancy complicates the calculation of selenium removal rates and undermines the reliability of the test results. <u>Contradiction in selenium removal</u> Figure 4 of Appendix 3-C shows that the dissolved selenium concentration in effluents from the second set of coal reject column tests (i.e., Replicate 2) exceeded its influent concentration of 0.2 mg/L after day 59 when the influent nitrate-N concentration was increased from 10 mg/L to 20 mg/L. This indicates selenium release rather than removal in the coal reject columns. This apparent "selenium release" was not observed in three of the four first set of coal reject column tests (i.e., Replicate 1). Although the laboratory study report attributed this contradiction to the longer storage time for materials used in the second set of tests compared to the first set, no evidence or reason was provided to support this claim. Moreover, the dissolved selenium concentration in effluents from waste rock columns was regularly higher than effluents from coal reject columns, implying potential selenium release from waste rock as well since effluents from coal reject columns were used as influents for waste rock columns. Based on these observations, ECCC has low confidence in the validity and effectiveness of the "layer cake" MRSF as primary mitigation measures to reduce selenium and nitrate leaching from the coal rejects and waste rock.	
ECCC-IR-52	5(1)(a)(i) Fish and Fish Habitat	6.1.4 Groundwater and Surface Water 6.2.2 Changes to Groundwater and Surface Water	9.5.4 Groundwater Assessment – Characterization of Residual Effects, Significance, Likelihood, and Confidence	The effects on aquatic life from groundwater discharging to surface water have not been adequately characterized. Page 9-1 of the EIS/A states, "*groundwater baseflow contributions to surface water constitute a pathway to receptor VCs such as fish*". To assess Project effects to groundwater quality, the Proponent compares predicted groundwater concentrations to the Elk Valley Water Quality Plan (EVWQP) Water Quality Targets/benchmarks[1] for selenium, sulphate, nitrate, and cadmium. ECCC notes that the EVWQP targets are not as protective of aquatic life as other benchmarks, and do not include all contaminants of concern for the Project. Based on the assessment, it is unclear whether the Project's impacts on groundwater will result in adverse effects to fish and other aquatic life.	ECCC recommends that the EIS/A assess predicted effects from groundwater quality considering more relevant and protective guidelines such as the standards set out in the Contaminated Sites Regulation for freshwater aquatic life use and/or the Federal Interim Water Quality Guidelines.
ECCC-IR-53	5(1)(a)(i) Fish and Fish Habitat	6.1.4 Groundwater and Surface Water	9.4.3 Groundwater Assessment – Baseline Program and Groundwater Modelling Results 9.5 Groundwater Assessment – Project Effects Assessment Appendix 9D Characterization of Groundwater - Surface Water Interactions	Insufficient groundwater and groundwater-surface water interaction data are provided for the Grave Creek drainage to understand Project effects. For example: a) The flow accretion study only includes one flow station. No further information is provided to accurately quantify the current (pre-project) groundwater-surface water interactions in Grave Creek (Appendix 9D: Figure 2-4, Section 3.1.1, Table 2-2). b) Only one groundwater well is located in the Grave Creek catchment (Appendix 9B: Figure 1) Project components in the Grave Creek watershed with the potential to affect groundwater-surface water interactions include, but are not limited to, a portion of the North Pit, Run of Mine (ROM) Stockpile Area, Overflow Coal Stockpile, Clean Coal Stockpile, Stockpile and Truck Dump, and the Rail Loadout Road. Groundwater-surface water interactions are critical to understand the potential environmental effects of the proposed Project and should be characterized in all affected watersheds. Without characterization of groundwater-surface water interactions in Grave Creek, there is uncertainty whether the geographic extent of the residual effect "changes in surface water quality from surface water-groundwater interactions" should be extended to include the Grave Creek drainage.	ECCC recommends the EIS/A characterize groundwater-surface water interactions in the Grave Creek watershed.
ECCC-IR-54	5(1)(a)(i) Fish and Fish Habitat	6.1.4 Groundwater and Surface Water 6.2.2 Changes to Groundwater and Surface Water	9.5.4 Groundwater Assessment – Characterization of Residual Effects, Significance, Likelihood, and Confidence	The capacity for natural attenuation in the receiving environment is unclear. The EIS/A refers to "natural attenuation" in support of the residual effects characterization for "Changes to Groundwater Quality Due to Infiltration of Contact Water to Groundwater" and when describing project effects due to the sediment ponds (p. 9-94). However, the EIS/A does not provide supporting data or rationale to justify the assumption of natural attenuation. In fact, studies in the Elk Valley have found that selenium and nitrate may act conservatively in groundwater, and that attenuation is limited (e.g., Szmigielski 2018, Storb 2023). ECCC notes that there may be implications for aquatic life when the groundwater is discharged to surface water if the concentrations of contaminants are underestimated due to unsupported assumptions regarding natural attenuation.	ECCC recommends that the EIS/A include rationale to support the assumption of natural attenuation in the receiving environment.

[1] The Crown Mountain Coking Coal Project refers to the Elk Valley Water Quality Plan benchmarks as Targets. The same terminology is used herein.

				<u>References</u>: Storb MB, Bussell AM, Caldwell Eldridge SL, Hirsch RM, Schmidt TS. Growth of Coal Mining Operations in the Elk River Valley (Canada) Linked to Increasing Solute Transport of Se, NO3-, and SO42- into the Transboundary Koocanusa Reservoir (USA-Canada). Environ Sci Technol. 2023 Nov 14;57(45):17465-17480. Doi: 10.1021/acs.est.3c05090. Szmigielski, J.T., Barbour, S.L., Carey, S.K., Kurylo, J., McClymot, A.F. Hydrogeology of a montane headwater groundwater system downgradient of a coal-mine waste rock dump: Elk Valley, British Columbia, Canada. Hydrogeol J 26, 2341–2356 (2018). https://doi.org/10.1007/s10040-018-1809-z	
ECCC-IR-55	5(1)(a)(i) Fish and Fish Habitat	3.2.1 Site Preparation and Construction	Chapter 9 Groundwater Assessment Appendix 9D Characterization of Groundwater - Surface Water Interactions	Impacts to groundwater from surface water may be underestimated due to uncertainty regarding the geographic extent (characterized in the EIS/A as "local") and magnitude (characterized in the EIS/A as "low") of the residual effect "Changes to Groundwater Quality due to Infiltration of Contact Water (i.e., Surface Water and Mine Site Drainage) to Groundwater". For example: a) The spatial boundaries for the groundwater LSA do not include all areas potentially impacted by the Project that might contribute contact surface water to groundwater (Figure 9.2-1). For example, there are Project components located outside of the LSA, including the site access road, rail loop, clean coal stockpile and truck dump, and rail loadout road. b) Groundwater modelling suggests near surface seepage would not extend beyond 500 m down-gradient of MRSF within 100 years (with deeper bedrock seepage travelling a maximum of 1000m in the same time period; page 9-121). Table 9.4-11 indicates hydraulic horizontal conductivity ranging from 4 x 10^{-2} to 9 m/day, meaning it is likely that groundwater seepage could travel further than 500 to 1000 m in 100 years. The furthest downstream well (GW-1-A/B) in the Alexander Creek drainage is just 4 km downstream of the toe of the MRSF dam and spillway, in an area of groundwater recharge (Figure 9.4-15). It is possible that groundwater seepage could discharge to surface water further than 4km downstream due to stated hydraulic horizontal conductivities (Table 9.4-11).	ECCC recommends: a) the groundwater LSA be extended to incorporate all Project components and their potential effects; or rationale be provided to support the characterization of "local" extent for the residual effect "Changes to Groundwater Quality due to Infiltration of Contact Water", given the occurrence of Project activities and components outside the groundwater LSA as well as the measured hydraulic horizontal conductivities; and b) the installation of an additional downstream well in the Alexander Creek drainage to monitor whether groundwater discharges in areas further downstream in Alexander Creek.
ECCC-IR-56	5(1)(a)(i) Fish and Fish Habitat	6.1.4 Groundwater and Surface Water	Chapter 11 Surface Water Quality Assessment Chapter 12 Fish and Fish Habitat Assessment Appendix 12D Aquatic Health Baseline Sampling Report	Information to support aquatic health and surface water quality characterization and predictions is inadequate and does not reflect recent impacts to aquatic life. ECCC notes that the information used to characterize baseline conditions and predict water quality downstream of the Project is more than 5 years old. Considerable changes in water quality and effects to aquatic life have been recently observed that are not represented by the outdated information used in the EIS/A. <u>Inadequate existing conditions information</u> Most of the existing conditions water quality data for the Project was collected in 2013 and 2014, with 1-2 sampling events in 2018 and 2019. Similarly, aquatic health and fish tissue data are limited, with samples for periphyton, benthic invertebrates, and fish tissue collected in just one year at each site in either 2017 or 2019, and no samples collected from Michel or Grave Creeks. Typically, a minimum of two years of recent data at each site is considered acceptable for an environmental assessment (BC MOE 2016). In Grave Creek, for example, this data may not reflect recent conditions or annual variation in the watershed (ECCC-IR-61), and this may be the case for other waterbodies as well. <u>Use of outdated Elk Valley Regional Water Quality Model</u> The EIS/A uses the 2017 version of the Elk Valley regional water quality model, which has since been updated to take into account adjustments made to the implementation plan for water treatment in the valley (Teck 2021). Therefore, the water quality model predictions generated by the 2017 model may not reflect recent changes in Teck's understanding of mass loading or changes to the water treatment implementation efficiency or schedule. <u>Lack of discussion of recent water quality effects to aquatic life in the RSA</u> The EIS/A does not discuss the recent impacts to aquatic life from water quality. In March 2023, Teck Coal Limited published their Evaluation of Cause report that investigated Westslope Cutthroat Trout recruitment patterns from 2017 to 2021 in the Harmer and Grave Creek populations. The Evaluation of Cause identified recruitment failure	ECCC recommends that the EIS/A integrate more recent information available on water quality and aquatic health, including but not limited to: a) two years of more recent data for existing conditions of surface water quality (monthly) and aquatic health for the LSA and RSA; b) the integration of updated Elk Valley Water Regional Water Quality Model predictions into the water quality model or a discussion of the implications of not including this information; and c) discussion of recent effects to aquatic life in the Elk Valley to provide a local and regional context to the effects proposed by the Project.

				(i.e., negligible number of fish added to the population in a given spawn year) in the Harmer Creek population during the 2018 spawn year, hypothesized to be related to the small size of juvenile (age-0) fish in 2018. In addition, reduced recruitment (i.e., number of fish in a given spawn year less than long-term average recruitment required for the population to be stable) was evaluated to have occurred in the in the Grave Creek population (2018 spawn year) and the Harmer Creek population (2017 and 2019 spawn year). Primary stressors for reduced recruitment included exposure to dietary selenium (Harmer Creek Evaluation of Cause Team 2023). ECCC notes that the information provided in the EIS/A may not be sufficient or current enough to accurately characterize the existing environment, predict potential effects, characterize residual effects within the local and regional ecological context, or determine monitoring objectives. References: Teck Coal Limited. 2021. 2020 Regional Water Quality Model Update Report. https://www.teck.com/media/Teck-EVWQP-2020-RWQM-Update-Report.pdf Harmer Creek Evaluation of Cause Team. 2023. Evaluation of Cause – reduced Recruitment in the Harmer Creek Westslope Cutthroat Trout Population. Report prepared for Teck Coal Limited. https://www.teck.com/media/Harmer-Creek-Evaluation-of-Cause%20-Report-March-2023.pdf	
ECCC-IR-57	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	11.5 Surface Water Quality Assessment – Project Effects Assessment Appendix 22B Supplementary Assessment of Selenium Bioaccumulation Risk to Fish	The EIS/A identifies six contaminants of potential concern for the Project: cobalt, cadmium, nickel, nitrate, selenium and sulphate (Section 11.5.4.1.1, pg. 11-70); however not all six contaminants of concern were assessed for watercourses potentially impacted by the Project, including the Elk River, Lake Koocanusa, West Alexander Creek, and Alexander Creek: a) In the Elk River and Lake Koocanusa, changes to water quality are only assessed for selenium, nitrate and sulfate. The EIS/A does not assess how the other contaminants of concern (i.e., cadmium, cobalt, nickel) will change in the Elk River and Lake Koocanusa as a result of the Project. b) The EIS/A does not predict the effects of selenium bioaccumulation in fish tissue in Lake Koocanusa. c) Calcite is not assessed as a potential contaminant of concern in either West Alexander Creek or Alexander Creek. Section 11.5.2.2.6 indicates that calcite deposits can be expected to form downstream of the sediment ponds in West Alexander Creek and potentially Alexander Creek, indicating calcite is likely a contaminant of concern for the Project as well. ECCC understands that the Proponent is working to obtain water quality modelling data from Teck Resources Ltd. for cadmium, cobalt, and nickel for the Elk River and Lake Koocanusa. ECCC notes that if the Proponent is unable to obtain water quality modelling data from Teck Resources Ltd., there are other ways in which the Proponent can assess if the Project is likely to affect cadmium, cobalt, and nickel concentrations. For example, the Proponent could conduct their own predictive modelling that is informed by their own baseline sampling or publicly available data. Without information on all contaminants of concern, ECCC is unable to comprehensively assess the potential effects of the Project on water quality and fish.	ECCC recommends that the EIS/A assess impacts to water quality and tissue quality for all contaminants of potential concern for the Project, in all potentially affected aquatic receiving environments.
ECCC-IR-58	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	Chapter 11 Surface Water Quality Assessment Table 11.5-4 Appendix 11B Surface Water Quality Baseline Report Table 1	No water quality prediction nodes or selenium bioaccumulation prediction nodes are located in the Michel Creek mainstem, despite baseline surface water quality sampling being conducted in Michel Creek (M1, upstream of confluence with Alexander Creek; and M2, downstream of confluence with Alexander Creek). The only water quality prediction nodes provided to assess the effects of the Project downstream of the Alexander Creek are located on the mainstem of the Elk River or in Lake Koocanusa (e.g., EV_ER1, RG_ELKORES, RG_DSELK). Similarly, no fish tissue predictions are provided for Michel Creek. Assessment nodes for fish tissue are only provided for Grave Creek, Alexander Creek, and one location on the Elk River. Michel Creek is already affected by other projects in the area, including Teck's Elkview Operations and Coal Mountain Operations. Without water quality or selenium bioaccumulation predictions in Michel Creek mainstem, environmental effects of the proposed Project on Michel Creek are uncertain.	ECCC recommends that the EIS/A include water quality and selenium bioaccumulation predictions for Michel Creek.

				Reference: Minnow Environmental. 2020. Regional Aquatic Effects Monitoring Program (RAEMP) Report, 2017 to 2019. Prepared for Teck Coal Limited. Available online: teck.com/media/10_2017-2019_RAEMP_Monitoring_Report_w_Cover_Page_compressed.pdf	
ECCC-IR-59	5(1)(a)(i) Fish and Fish Habitat	4.2 Study Strategy and Methodology 6.1.4 Groundwater and Surface Water 6.2.2 Changes to Groundwater and Surface Water	Appendix 10A Flow and Water Quality Impact Assessment Modelling Appendix 11F Water Quality Prediction Model	The EIS/A lacks details on the inputs and outputs of water quality model. For example, the EIS/A does not describe how geochemical source terms for water quality modelling have been derived from geochemical characterization and testing results. Although Section 3.5.1 of Appendix 11-F states that such information was provided in a separate report (i.e., the geochemical modeling report, SRK 2020), this referenced report cannot be found in the EIS/A. The following geochemical information is needed to verify the appropriateness of the methods used, assumptions made, and uncertainties involved: • factors considered and equations applied in the development of the geochemical source terms; • the size of the MRSF; • the area of the MRSF that will be exposed, covered, and/or reclaimed by year; • the specifications for the cover and final remediation that support the assumed infiltration parameters; and • the tabular prediction data for streamflow and water quality (note Appendix 10A states that tabular results are provided with the appendix in electronic format, however this information was not provided at the time of the EIS/A submission nor provided in time for ECCC to consider in this review/submission; ECCC may review Attachments 2 and 3 of Appendix 10A and provide advice in a subsequent round of commenting). Without this information, ECCC is unable to assess whether the geochemical source terms used in water quality modelling are properly developed, model predictions for downstream water quality are reliable, and the effects assessment for water quality and fish are accurate.	ECCC recommends that the Proponent provide the referenced report on geochemical source term development (i.e., the geochemical modeling report, SRK 2020) for review, or describe in detail how geochemical source terms have been developed and applied to the water quality model. At a minimum, ECCC recommends that the Proponent provide the following information: a) methods used to calculate all geochemical source terms with sufficient detail such that they can be recalculated; b) units for the source terms in Tables 22 to 27 in Appendix 11-F; c) size of the MRSF in hectares over time; d) area of MRSF assumed to be exposed, covered, and reclaimed by year; e) specifications for the cover and final remediation that support the runoff and infiltration parameters in Table 18 of Appendix 11-F; and f) tabular streamflow and water quality prediction results (note Attachments 2 and 3 of Appendix 10A were not provided at the time of the EIS/A submission nor provided in time for ECCC to consider in this review/submission; ECCC may review this information and provide advice in a subsequent round of commenting).
ECCC-IR-60	5(1)(a)(i) Fish and Fish Habitat	6.1.2 Geology and Geochemistry 6.2.2 Changes to Groundwater and Surface Water	Appendix 11C Geochemical Baseline	The use of analogue data from other coal mines in the Elk Valley creates uncertainty in the geochemical source terms for MRSF effluent chemistry predictions. Geochemical static testing and whole rock elemental analysis have been conducted on 235 mine rock and two coal plant reject samples. Among them, twelve samples have been selected for further kinetic testing (i.e., humidity cell test). Section 3.2 of Appendix 11C states that one of the objectives of these tests is to demonstrate the close similarity in geochemical characteristics between mine waste rock from the Project and that of other coal mines in the Elk Valley, so that observations made from the other coal mines could be used as analogue data for mine waste rock management and effluent quality predictions. Information presented in Table 3-1 of Appendix 11C implies that monitoring data from analogue sites would be applied in the prediction of ARD potential and drainage chemistry for the MRSF. Monitoring data from analogue sites, if applied correctly, can reduce uncertainties associated with the geochemical source terms for the MRSF of the Project. However, it is not clear if and how the analogue data was used in developing the source terms for the MRSF, including for selenium. For example, statistics for selenium concentrations in the 237 mine waste samples, grouped by rock type, are presented in Table 5-1, Table 5-2, and Table 5-3 of Appendix 11C and results of selenium release rate from humidity cell testing of the twelve mine waste samples are shown in Figure 5-27 of Appendix 11C. No data on selenium concentration and release rates are presented for analogue sites in the Elk Valley; however, a comparison of geochemical static testing and whole rock elemental analysis for the Project to analogue sites in the Elk Valley (Section 6.1 of Appendix 11C) concludes that, "*[A]verage selenium in coal and waste rock is similar and typically between 0.4 mg/kg to 3 mg/kg. The selenium data for Crown Mountain is comparable to this, showing that the*	ECCC recommends that the EIS/A describe how geochemical source terms for the Project have been developed from analogue data and, if applicable, geochemical testing data from the Project be compared to data from analogue sites in the Elk Valley in a manner that allows for detailed comparison of the range in selenium content and release rates (for example in box plots, grouped by waste rock type, and with all data points included in the graph).

				average selenium content in coal is 2.13 mg/kg and for waste rock it is between 0.80 and 2.15 mg/kg." ECCC notes that this comparison is limited to summary statistics, not a comparison of the full range of data (e.g., in box plots). ECCC also notes that no comparison is made between humidity cell mine waste selenium release rates for the Project and those of analogue sites in the Elk Valley. Selenium leaching from mine waste rock is a concern for downstream water quality at all coal mines in the Elk Valley, including for the Project. Accurate prediction of selenium concentrations in effluent from the proposed MRSF is critical for the prediction of selenium concentrations in downstream water bodies and assessment of Project effects on fish. The limited use data from analogue sites introduces uncertainty as to whether the data is even representative of conditions at the Project site.	
ECCC-IR-61	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	Appendix 11B Surface Water Quality Baseline Table 3 Appendix 11F Water Quality Prediction Model Figure 31	ECCC notes that the EIS/A may underestimate the concentration of contaminants in Grave Creek by using either outdated baseline chemical information and/or an outdated water quality model: a) Measured selenium concentrations from the BC EMS database (i.e., 29.9 ug/L dissolved Se in Grave Creek near the mouth of the Elk River; RG_GRDS, E326844, September 9, 2023) are higher than the selenium predictions from the water quality model for the same location and time (i.e., ~18 µg/L at Lower Grave Creek station GC-1, September 2023; Appendix 11F, Figure 31). b) The baseline data (collected from 2012-2019) no longer reflects current (pre-project) selenium concentrations in Grave Creek. The Project uses a median total selenium in Lower Grave Creek of 22.7 µg/L (station H1, Appendix 11B, Table 3), which is lower than the median dissolved selenium in Lower Grave Creek measured from 2021-2023 of 27.9 ug/L (RG_GRDS; E326844; November 2021 to September 2023). Note that predictions are provided for the dissolved fraction, so baseline data should also represent dissolved fraction. The Project is predicted to impact water quality in Upper Grave Creek, which flows into Lower Grave Creek. Lower Grave Creek also receives loading from Teck's Elkview Operations via Harmer Creek. This is particularly important given recent impacts to water quality in Grave Creek due to Teck's operations which contributed to reduced recruitment of the Harmer Creek population of Westslope Cutthroat Trout (2017 and 2019), reduced recruitment of the Grave Creek population of Westslope Cutthroat Trout (2018), and recruitment failure in Grave Creek during the 2018 spawn year (see ECCC-IR-56). Several Project components are planned to be located in the Grave Creek drainage, with the potential to affect surface water via groundwater-surface water interactions (see ECCC-IR-53) among other impacts such as dust. Without updated baseline chemical information and accurate water quality predictions for selenium and other contaminants that may be affected by current mining activity in Lower Grave Creek, it is possible that effects to surface water quality and aquatic life are underestimated. <u>References:</u> Province of British Columbia. 2023. Elk Valley Water Quality Hub. Available online: https://a100.gov.bc.ca/pub/ems/graphingExceedenceCriteria.do?userAction=showGraph&multilistRequestor=graphingExceedenceCriteria&officeMultilistRequestor=graphingExceedenceCriteria&bean.p_ems_id=E326844 (queried January 9, 2024). Teck Coal Ltd. 2024. Implementation Plan Adjustment 2022. Available online: teck.com/media/EVWQP_2022_ImplementationPlanAdjustment_Main_Report.pdf	ECCC recommends that the EIS/A use updated baseline and predicted water quality concentrations for selenium, as well as any other parameters that may be affected by current mining activities (i.e., including but not limited to sulphate, nitrate, cobalt, calcite, and nickel).
ECCC-IR-62	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	Chapter 11 Surface Water Quality Assessment Table 11.5-6	Effects to aquatic life from predicted nickel concentrations for the Project may be underestimated. The EIS/A establishes screening threshold levels based on current provincial and federal guidelines (Table 11.5-6). For nickel, the BC water quality guideline (150 µg/L with hardness > 180 mg/L as $CaCO_3$) was used as a screening threshold. However, recent work in the Elk Valley has linked effects in benthic invertebrates to nickel concentrations at levels below current guidelines (Teck 2022 Ltd). This finding is also supported by the scientific literature which reports effects at nickel concentrations well below established guidelines (e.g., EC_{20} growth and reproduction for mayflies of 7-53 ug/L) (Besser et al.2013; Besser et al. 2011 and Soucek et al. 2020). ECCC is aware that updates to the CCME and BC nickel guidelines are currently underway (Burton and Azizishirazi 2023). Using screening values that don't	ECCC recommends that the EIS/A use nickel thresholds that are protective of all endpoints and species (including reproduction in mayflies), and that the screening criteria be amended appropriately.

				protect all species and life stages of aquatic life introduces uncertainty into the assessment may underestimate residual effects to water quality and fish (in particular when characterizing magnitude and geographic extent). <u>References:</u> Burton A and Azizishirazi A. 2023. Development of water quality guidelines for the protection of aquatic life for nickel using the biotic ligand model and other approaches. Canadian Ecotoxicity Workshop 2023, Ottawa Ontario. Soucek DJ, Dickinson A, Schlekat C, Genderen EV, Hammer EJ. 2020. Acute and Chronic Toxicity of Nickel and Zinc to a Laboratory Cultured Mayfly (Neocloeon triangulifer) in Aqueous but Fed Exposures. Environmental Toxicology and Chemistry 39(6) 1196-1206. Besser JM, Brumbaugh WG., Ingersoll CG, Ivey CD, Kunz JL, Kemble NE, Schlekat CE, Graman ER. 2013. Chronic toxicity of nickel-spiked freshwater sediments: Variation in toxicity among eight invertebrate taxa and eight sediments. Environmental toxicology and chemistry, 32(11), 2495-2506. Besser JM, Brumbaugh WG, Kemble NE, Ivey CD, Kunz JL, Ingersoll CG, and Rudel D. 2011. Toxicity of nickel-spiked freshwater sediments to benthic invertebrates—Spiking methodology, species sensitivity, and nickel bioavailability: U.S. Geological Survey Scientific Investigations Report 2011–5225, 53 p. plus appendixes. Teck Ltd. 2022. Elkview Operations (EVO) Local Aquatic Effects Monitoring Program (LAEMP), 2022. Prepared by: Minnow Environmental Inc. for Teck Coal Limited.	
ECCC-IR-63	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	11.5.2.2 Surface Water Quality Assessment – Discussion of Potential Effects	Page 11-43 of the EIS/A states "*erosion and sedimentation may occur during all phases of the Project, resulting in elevated levels of TSS and turbidity in waterbodies within, adjacent to, and downstream of the Project footprint*"; however, the predicted concentrations of total suspended solids (TSS) in the receiving environment are unclear. The EIS/A concludes that "*no residual effects from non-contact water runoff are predicted through the implementation of the Erosion and Sediment Control Plan and Site Water Management Plan*" (p. 11-52) and "*residual effects from dust deposition are not predicted on surface water quality through the implementation of the Air Quality and Greenhouse Gas Management Plan*" (p. 11-53). With only qualitative information and no quantitative predictions, ECCC cannot assess the risk to aquatic life from TSS.	ECCC recommends that the Erosion and Sediment Control Plan, Site Water Management Plan, and the Air Quality and Greenhouse Gas Management Plan clearly describe how effects to water quality and aquatic receptors from TSS and dust deposition will be prevented. The plans should also include monitoring approaches designed to demonstrate the effectiveness of the plans in all Project phases.
ECCC-IR-64	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water 6.4 Mitigation Application Information Requirements Section 3.5	11.5.4.2 Surface Water Quality Assessment – Potential Residual Effects Assessment Appendix 10A Flow and Water Quality Impact Assessment Modelling Appendix 11H Interim and Main Sediment Pond 50th and 95th Percentile Geochemical Charts Chapter 21 Accidents and Malfunctions Assessment	Water quality modelling scenario B.1.c (50th percentile) and B.2.c (95th percentile) predict increased impacts to water quality in Alexander Creek should the MRSF fail but these predictions were not carried forward into the effects assessment for Valued Components, including surface water quality. Of the 12 water quality scenarios modelled, only two scenarios were considered in the surface water quality effects assessment in Chapter 11, Scenario B.1.a (50th percentile) and B.1.b (95th percentile), both of which assume the MRSF layering design is successful and works as intended. As a result, the characterization of residual effects does not consider the effects should the MRSF technology fail. Given that the MRSF "layer cake" is considered an emerging technology (i.e., unproven mitigation measure), the EIS/A should assess effects from possible failure. ECCC notes this is a requirement of: • the EIS/A Guidelines for the Project: "*Where mitigation measures are proposed to be implemented for which there is little experience or for which there is some question as to their effectiveness, the potential risks and effects to the environment should those measures not be effective will be clearly and concisely described, and, where appropriate, contingency measures should be identified.*" • the provincial Application Information Requirements for the Project, Section 3.5: "*Evaluate the anticipated success of each mitigation measure and describe rationale and analysis for these evaluations. If there is little relevant/applicable experience with a proposed mitigation measure and there may be some question as to its effectiveness, describe the potential risks and uncertainties associated with use of the mitigation*"); and • the Impact Assessment Agency of Canada's Operational Policy Statement on Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects Under CEAA 2012: "*A*	ECCC recommends that the residual effects assessment for water quality take into account the uncertainty in the predicted effectiveness of the MRSF. Potential effects to VCs resulting from MRSF failure should be clearly described in the EIS/A, and reflected in the characterization of residual effects for each VC (e.g., Surface Water Quality, Groundwater Quality, Fish and Fish Habitat, etc.).

				residual environmental effect should take into account the predicted effectiveness of proposed mitigation measures and any uncertainties associated with these measures." MRSF failure would primarily impact the residual effect "Changes in Surface Water Quality from Sediment Pond Discharge" which subsequently impacts the other VCs, including surface water, groundwater, and fish. A comprehensive understanding of the effects in failure mode is necessary to assess whether follow-up monitoring and adaptive management could prevent unacceptable effects to these VCs, in case the MRSF is not successful.	
ECCC-IR-65	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	Appendix 11F Water Quality Prediction Model	It is unclear whether the water quality modelling predictions scale correctly with changes to source terms. For example, in the 50th percentile successful layer approach scenario (scenario B1a), the selenium source term for the Waste Rock Dump (WRD) seepage is 0.028 in mine year 16. In the 50th percentile MRSF failure scenario (B1c), the selenium source term for the MRSF seepage is 0.357 in mine year 16. This is a difference of more than 12 times. However, according to the figures in Appendix 11F, the concentration of selenium in the sedimentation pond effluent only increases by approximately four times (Figures 33 and 34). In contrast, in scenarios B1a and B1b, when selenium source term for the WRD seepage doubles, the concentration in the effluent similarly doubles. It is unclear why this would be different in the MRSF failure scenario. These predictions are used to assess effects to aquatic life, so it necessary to fully understand how changes in source terms affect the composition of the effluent.	ECCC recommends that the EIS/A include rationale to explain why the contaminant concentrations in effluent do not scale with the source terms.
ECCC-IR-66	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water 6.3.1 Fish and Fish Habitat	11.5.3 Surface Water Quality Assessment – Mitigation Measures Chapter 12.5.3 Fish and Fish Habitat Assessment – Mitigation Measures Chapter 9.5.3 Groundwater Assessment – Mitigation Measures Chapter 33.4.1 Management and Monitoring Plans – Environmental	It is unclear how lack of clean water diversions will affect water quality. Page 3-65 of the EIS/A states "*Clean water diversion infrastructure is not planned at site*"; however, there appears to be conflicting information in other sections of the EIS/A. Chapters 9, 11, 12, and 33 reference clean water diversions as a mitigation measure for water quality, and the water quality model may have also been generated based on this assumption. Clean water diversions are typically key mitigation measures for water quality at mines. They reduce the amount of water that interacts with waste rock, thereby reducing loadings of contaminants and effects to aquatic life. If clean water diversions are no longer planned, the water quality model and effects assessment should accurately reflect this information.	ECCC recommends that the Proponent: a) clarify whether clean water diversions are or are not planned for the Project; b) update all parts of the EIS/A accordingly, including the water quality model and effects assessment; and c) describe in the EIS/A the impacts to water quality due to the lack of clean water diversions and propose alternative mitigation measures, as needed.
ECCC-IR-67	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	Appendix 11I Mass Comparison Nitrate Selenium and Sulphate Contributions in Michel Creek	The EIS/A is not clear on the total loading (i.e., mass addition) of the contaminants of concern that the Project will add to affected watercourses: a) Appendix 11I states that the annual mass contribution of the Project to Michel Creek will be 0.29 to 1.6 kg of Se (pages 11-13). However, assuming a discharge rate of 0.15 m^3/s (Table 10.5-11) and selenium concentration of 0.004 mg/L (Figure 33, Appendix 11F), ECCC calculates approximately 19 kg/year of selenium load addition to Alexander Creek. It is unclear where the missing loads from Alexander Creek are going. Similar observations were made for nitrate and sulphate. b) Only loading of selenium, nitrate, and sulphate are provided for Michel Creek. Loads of all contaminants of concern (including calcite, cobalt, and nickel) are not provided for Michel Creek or any of the affected other watercourses (i.e., West Alexander Creek, Alexander Creek, Elk River, Grave Creek, and Lake Koocanusa).	ECCC recommends the EIS/A: a) provide discharge rates and concentrations to support all loading calculations; and b) describe the total amount of Project-related loading of all contaminants of potential concern in all affected watercourses (i.e., West Alexander Creek, Alexander Creek, Michel Creek, Elk River, Grave Creek, and Lake Koocanusa).

ECCC-IR-68	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	11.5.4.3 Surface Water Quality Assessment – Characterization of Residual Effects Table 11.5-8	ECCC notes the following discrepancies in the EIS/A for residual effects characterization of magnitude and context for: a) Change in surface water quality from disposal of mine rock and coal rejects: Section 11.5.4.3 identifies the magnitude as "High" and context as "Neutral" (Chapter 11, p. 11-93), whereas Table 11.5-8 identifies magnitude as "Low" and Context as "High" (Chapter 11, p. 11-98). b) Change in surface water – groundwater interactions: Section 11.5.4.3 identifies the magnitude as "Low" and context as "High" (Chapter 11, p. 11-94), whereas Table 11.5-8 identifies magnitude as "High" and Context as "Neutral" (Chapter 11, p. 11-98).	ECCC recommends that the residual effects be characterized consistently throughout the EIS/A.
ECCC-IR-69	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	11.5.4.3.1 Surface Water Quality Assessment – Characterization of Residual Effects – Change in Surface Water Quality from Disposal of Mine Rock and Coal Rejects	The residual effects characterization for changes in surface water quality may be underestimated for the residual effect "Change in Surface Water Quality Disposal of Mine Rock and Coal Rejects". Please note similar comments have been made for all three residual effects to surface water and the residual effect to Fish and Fish Habitat (see ECCC-IR-70, ECCC-IR-71 and ECCC-IR-77). <u>Geographical extent may be underestimated</u> The EIS/A characterizes that the geographical extent as "discrete", meaning effects will occur within the Project Footprint. This characterization is based on the assumption that "*surface runoff or seepage from the Mine Rock Storage Facility will be contained in the Interim or Main Sediment Ponds within the Project footprint and will not enter the receiving environment without monitoring and adaptive management*". However, ECCC notes that there could be potential for effects to surface water quality in the receiving environment, given the lack of clean water diversions (see ECCC-IR-66) and b) surface water-groundwater interactions (see ECCC-IR-53). <u>Reversibility may be underestimated</u> The EIS/A states that the reversibility for the residual effect is "reversible long-term", meaning the effect is potentially reversible over a long period of time. The EIS/A also states that changes in surface water quality resulting from metal leaching/acid rock drainage (ML/ARD) are anticipated to be potentially reversible once the site if fully reclaimed. However, water quality effects in three affected watercourses downstream of the Mine Rock Storage Facility were not fully assessed (i.e., Michel Creek, the Elk River and Lake Koocanusa; see ECCC-IR-57, ECCC-IR-58, and ECCC-IR-73) therefore the reversibility of water quality effects in these areas may be underestimated.	ECCC recommends that the EIS/A justify or revise the residual effects characterization for change in surface water from disposal of mine rock and coal rejects, in consideration of uncertainties in the geographic extent and reversibility of Project effects.
ECCC-IR-70	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	11.5.4.3.2 Surface Water Quality Assessment – Characterization of Residual Effects – Change in Surface Water Quality from Surface Water – Groundwater Interactions	The residual effects characterization for changes in surface water quality may be underestimated for the residual effect "Change in Surface Water Quality from Surface Water – Groundwater Interactions". Please note similar comments have been made for all three residual effects to surface water and the residual effect to Fish and Fish Habitat (see ECCC-IR-69, ECCC-IR-71, and ECCC-IR-77). <u>Magnitude may be underestimated</u> The EIS/A states that the magnitude is "low" because the majority of potentially impacted groundwater will be captured by the sediment ponds and natural attenuation would further reduce potential risk of impact from these waters. "Low" is defined as "*change that is not likely to have a definable, detectable or measurable effect above baseline or is below established thresholds of acceptable change*" (Table 5.3-9), while "moderate" is defined as "*change that is definable, measurable or detectable and differs from the average value for baseline conditions and approaches the limits of natural variation but is equal to or only marginally above standards/guidelines or established thresholds of acceptable change*" (Table 5.3-9). ECCC notes that the EIS/A may have underestimated water quality effects related to surface water-groundwater interactions, including the following: a) MRSF failure model not considered for residual effects to surface water from sediment pond discharge (see ECCC-IR-64) b) Groundwater quality not compared to aquatic life guidelines (see ECCC-IR-52) c) Capacity for natural attenuation is unclear (see ECCC-IR-54) d) Insufficient surface water and groundwater data in the Grave Creek drainage (see ECCC-IR-53) e) Uncertainty regarding the geographic extent and therefore, magnitude of surface water-groundwater impacts (See ECCC-IR-55)	ECCC recommends that the EIS/A justify or revise the residual effects characterization for change in surface water from surface water-groundwater interactions, in consideration of uncertainties in the magnitude, geographic extent and reversibility of Project effects.

				f) Unclear what thresholds were used to determine magnitude (see ECCC-IR-72) <u>Geographical extent may be underestimated</u> The EIS/A states that the geographical extent is “discrete”, meaning effects will occur within the Project footprint. However, geographic extent of the seepage may be underestimated (see ECCC-IR-55), therefore the effects in these areas may be underestimated. <u>Reversibility may be underestimated</u> The EIS/A states that the reversibility for the residual effect is “reversible long-term”, meaning the effect is potentially reversible over a long period of time. The EIS/A also states that groundwater-surface water interactions are expected to return to pre-project conditions due to natural attenuation and gradual re-equilibrium. However, the capacity of natural attenuation is unclear (see ECCC-IR-54) and other research in the Elk Valley has indicated groundwater contamination in the Elk Valley can have irreversible effects over the long-term (Storb et al. 2023). <u>Reference:</u> Storb MB, Bussel AM, Caldwell Eldridge SL, Hirsch RM, and Schmidt TS. 2023. Growth of Coal Mining Operations in the Elk River Valley (Canada) Linked to Increasing Solute Transport of Se, No3-, and SO42- into the Transboundary Koocanusa Reservoir (USA-Canada). Environmental Science and Technology 57(45): 17465-17480.	
ECCC-IR-71	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	11.5.4.3.3 Surface Water Quality Assessment – Characterization of Residual Effects – Change in Surface Water Quality from Sediment Pond Discharge	The residual effects characterization for changes in surface water quality may be underestimated for the residual effect “Change in Surface Water Quality from Sediment Pond Discharge”. Please note similar comments have been made for all three residual effects to surface water and the residual effect to Fish and Fish Habitat (see ECCC-IR-69, ECCC-IR-70 and ECCC-IR-77). <u>Magnitude may be underestimated</u> The EIS/A states that the magnitude is “moderate” because exceedances of BC water quality guidelines for cadmium, cobalt and selenium are only predicted to occur in West Alexander Creek and Alexander Creek upstream of Highway 3 in the 95th percentile scenario. “Moderate” is defined as “*change that is definable, measurable or detectable and differs from the average value for baseline conditions and approaches the limits of natural variation but is equal to or only marginally above standards/guidelines or established thresholds of acceptable change*” (Table 5.3-9). However, under the 50th percentile scenario water quality exceedances occur in West Alexander Creek. It is unclear what thresholds were used for magnitude (see ECCC-IR-72). Additionally, the EIS/A underestimates water quality effects related to the sediment discharge, including the following: a) MRSF failure model not considered for residual effects to surface water from sediment pond discharge (see ECCC-IR-64). b) Water and tissue projections were not provided for Michel Creek, an already impacted receiving environment (see ECCC-IR-58). c) Nickel thresholds are greater than what would be expected to cause effects to aquatic life (see ECCC-IR-62). d) No mitigation measures were identified to minimize generation of organic selenium (see ECCC-IR-82). e) Unclear what thresholds were used to determine magnitude (see ECCC-IR-72). <u>Geographical extent may be underestimated</u> The EIS/A states that the geographical extent is “local”, meaning within the LSA. However, water quality effects in Michel Creek, the Elk River and Lake Koocanusa were not fully assessed (see ECCC-IR-57, ECCC-IR-58, and ECCC-IR-73) therefore the effects in these areas may be underestimated. <u>Context may be underestimated</u> The EIS/A states that the context for the residual effect is “neutral”, meaning assimilative capacity is available and there is the possibility of return to baseline conditions after the sediment pond is decommissioned.	ECCC recommends that the EIS/A justify or revise the residual effects characterization for change in surface water from sediment pond discharge, in consideration of uncertainties in the magnitude, geographic extent and context of Project effects.

ECCC-IR-72	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water 6.3.1 Fish and Fish Habitat	11.5 Surface Water Quality Assessment – Project Effects Assessment 11.6 Surface Water Quality Assessment – Cumulative Effects Assessment 12.5 Fish and Fish Habitat Assessment – Project Effects Assessment 12.6 Fish and Fish Habitat Assessment – Cumulative Effects Assessment	ECCC notes that the criteria used to determine the magnitude (expected size or intensity) of a residual effect on water quality changes is not consistent throughout the EIS/A. The EIS/A never lists the specific thresholds used to determine magnitude; however, the results of the residual effects characterizations show that a wide variety of criteria are used as thresholds for "low" levels of change (i.e., predictions that are equal to or below these levels would be considered "low" magnitude). This was observed for selenium, sulphate, and nitrate; however, selenium is shown here as an example: • Alexander Creek: 2 µg/L selenium (BC Water Quality Guideline) • Michel Creek: 20 µg/L (Teck's permit limit at EV MC2; p. 11-113) • Elk River: 19 µg/L (EVWQP long-term water quality target for EV_ER1; p. 11-88) • Lake Koocanusa: 2 µg/L selenium (BC WQG and EVWQP long-term water quality target; 11-91). For context, the background concentrations for selenium in the Project area averages ~0.853 µg/L with a 95th percentile of 1.51 µg/L. The definition of low, moderate, and high magnitude are as follows: "***Low:*** *change that is not likely to have a definable, detectable, or measurable effect above baseline (i.e., potential effect is within a normal range of variation) or is below established thresholds of acceptable change (e.g., water quality guideline).* ***Moderate****: Change that is definable, measurable or detectable and differs from the average value for baseline conditions and approaches the limits of natural variation but is equal to or only marginally above standards/guidelines or established thresholds of acceptable change.* ***High****: Change that is easily definable, measurable or detectable and from baseline conditions, exceeding guidelines or established thresholds of acceptable change."* (Table 5.3-9). It is unclear why the criteria used for "low" magnitude of effect range from 0.002 to 0.020 mg/L, while the baseline concentrations for the area range from 0.000853 to 0.00151 mg/L. The thresholds for Michel Creek and the Elk River in particular are more than an order of magnitude above the baseline concentrations. The magnitude thresholds for these waterbodies are based on EVWQP targets and the permit limit for an operating mine. These targets/limits are not meant to be used as "thresholds of acceptable change" or pollute up to limits. It is unclear whether these threshold levels would result in "low" magnitude effects given that they are well above water quality guidelines and baseline conditions.	ECCC recommends that the Proponent provide rationale for the different threshold levels that they have indicated would result in "low" magnitude of effects, particularly when these thresholds are well above the normal range of variation and vary by an order of magnitude. Additionally, ECCC recommends that the Proponent provide similar rationale for which quantitative thresholds were used for "moderate" and "high" magnitude classifications.

ECCC-IR-73	5(1)(a)(i) Fish and Fish Habitat	6.3.4 Transboundary Environment	11.6 Surface Water Quality Assessment – Cumulative Effects Assessment
			
			12.6 Fish and Fish Habitat Assessment – Cumulative Effects Assessment
				The cumulative effects assessment boundaries for the Surface Water VC and Fish and Fish Habitat VC do not include the US portion of Lake Koocanusa. ECCC is of the view that the Proponent's rationale for not including the US portion of Lake Koocanusa is insufficient for the following reasons:
				• Historical and ongoing coal mining activities have resulted in elevated selenium concentrations throughout the Elk Valley, including Lake Koocanusa;
				• The Project is predicted to contribute additional selenium loading to Lake Koocanusa; and
				• The EIS/A acknowledges that "*there is the potential for transboundary cumulative effects to surface water quality in Lake Koocanusa to occur during the Operations, Reclamation and Closure, and Post-Closure phases of the Project as a result of the Interim and Main Sediment Pond discharges to the receiving environment in West Alexander Creek*" (Section 11.6.2.1, PDF pg. 105).
				• The EIS/A Guidelines require consideration of transboundary effects:
				  ○ *"spatial boundaries take into account any transboundary effects*" (section 3.3.3)*;*
				  ○ *"the effects assessment include baseline environmental information specific to lands located outside Canada (e.g., Lake Koocanusa in the United States) that may be affected by the Project which is required for the assessment of any transboundary environmental effects"* (section 6.1.8); and
					ECCC recommends that the US portion of Lake Koocanusa be included in the study area for the cumulative effects assessment.
					
					ECCC also recommends that the Proponent review IAAC's *Cumulative Effects Assessment Guidance for CEAA 2012 Projects* for strategies on assessing cumulative effects when there is uncertainty regarding the future state of a Valued Component (e.g., scenario building).

				○ *"the effects to the environment outside Canada include consideration of changes in concentrations of contaminants of concern in the aquatic ecosystem on federal lands and/or in Lake Koocanusa"* (section 6.3.4).	
ECCC-IR-74	5(1)(a)(i) Fish and Fish Habitat	6.6.3 Cumulative Effects Assessment	11.6 Surface Water Quality Assessment – Cumulative Effects Assessment 12.6 Fish and Fish Habitat Assessment – Cumulative Effects Assessment	ECCC notes that the cumulative effects assessment for surface water quality (Chapter 11) and fish and fish habitat (Chapter 12) do not take into account all available information on potential effects, and therefore may not assess cumulative effects accurately. For example, the cumulative effects assessment, did not consider: • Updated Elk Valley Water Quality Model results (the Application relies on 2017 information) (ECCC-IR-56) • Cadmium, cobalt, and nickel concentrations in the Elk River and Lake Koocanusa (ECCC-IR-57) • Selenium fish tissue predictions for Lake Koocanusa (ECCC-IR-57) • Michel Creek water quality predictions for all contaminants of concern (ECCC-IR-58) • Selenium bioaccumulation predictions in Michel Creek, the Elk River, and Lake Koocanusa (ECCC-IR-57, ECCC-IR-58) ECCC notes that the water quality model predictions and water quality effects assessment for the Project can be considered a "best case scenario", since they do not consider the uncertainty associated with the geological sampling, geochemical testing, water quality modelling, and the potential for MRSF failure (see ECCC-IR-51). Additionally, the loadings to Michel Creek and the RSA may be underestimated, even under the best-case scenario (see ECCC-IR-67). These issues could result in higher than predicted effects to water quality and higher than predicted contaminant loadings from the Project to the Elk Valley and beyond. Furthermore, the EIS/A does not assess the effects of the Project in *combination* with other projects, rather it only assesses it in *comparison*. The conclusion that the effects of the Project are "*negligible*" in the Elk River and Lake Koocanusa is based on a comparison which identifies the Project's predicted effects as "*relatively less significant*" than the effects of other nearby projects. ECCC notes that this is a misinterpretation of cumulative effects, which should consider the total effect of all actions on the Valued Component, regardless of how small or large a project's own contribution. In this case, for example, the increase in selenium in Lake Koocanusa as a result of the Project is predicted to be less than 1%, but this does represent the incremental contribution of the Project to cumulative effects. The Montana Department of Environmental Quality water quality guideline for Lake Koocanusa is 0.8 µg/L selenium (Montana DEQ, 2022). This guideline is already exceeded on a seasonal basis in Lake Koocanusa, and exceedances may occur more often if the Project goes ahead. <u>Reference:</u> Montana Department of Environmental Quality (DEQ). 2022. Selenium Standards Lake Koocanusa & Kootenai River 2022 Update. Available online: https://deq.mt.gov/files/Water/WQInfo/Documents/Water Quality Planning Standards/2022-Selenium-Fact-Sheet.pdf	ECCC recommends the Proponent take a conservative approach for the assessment of cumulative effects to water quality. This should include, at minimum: • use of updated Elk Valley Water Quality model results (including cadmium, cobalt and nickel concentrations in the Elk River and Lake Koocanusa and prediction of all COPCs in Michel Creek); • consideration of selenium fish tissue predictions for Lake Koocanusa, Michel Creek, and the Elk River; • consideration of the MRSF failure scenario; and, • consideration of cumulative effects as the total effect of all actions on the Valued Component, regardless of the size of the project's contribution, with particular emphasis on water quality in Michel Creek, the Elk River, and Lake Koocanusa.
ECCC-IR-75	5(1)(a)(i) Fish and Fish Habitat	6.6.3 Cumulative Effects Assessment	11.6.6 Surface Water Quality Assessment – Cumulative Effects Assessment – Characterization of Residual Cumulative Effects 12.6.6 Fish and Fish Habitat Assessment – Cumulative Effects Assessment – Characterization of Residual Cumulative Effects	The characterization of cumulative effects on water quality and fish may be underestimated. <u>Duration may be underestimated</u> The EIS/A states that the potential cumulative effects are "long-term", however "long-term" is defined as "*effect lasts greater than 19 months and less than 34 years over the course of the Operations, Reclamation and Closure, and Post-Closure phases*" (Table 5.3-9). Cumulative effects of changes in water quality in the Elk Valley, including effects from the Project, are projected to occur well beyond the next 34 years according to the modeling in the Application (Appendix 10A, Appendix 11F). <u>Magnitude may be underestimated</u> The EIS/A states that the magnitude of effect will be "low to moderate". "Low" is defined as "change that is not likely to have a definable, detectable or measurable effect above baseline or is below established thresholds of acceptable change" (Table 5.3-9), while "moderate" is defined as "change that is definable, measurable or detectable and differs from the average value for baseline conditions and approaches the limits of natural variation but is equal to or only marginally above standards/guidelines or established thresholds of acceptable change" (Table 5.3-9). However, the EIS/A predicts concentrations of selenium well above the limits of natural variation in	ECCC recommends that the Proponent justify or revise the cumulative effects assessment for water quality and fish, in consideration of the uncertainties in the duration, magnitude, geographic extent, and context.

				nearly every watercourse, and levels well above water quality guidelines in Michel Creek and the Elk River. Further, ECCC notes that the thresholds used to determine effects (e.g., EVWQP long-term and short-term targets) are not meant as pollute up to limits or established limits of acceptable change (see ECCC-IR-72). Geographic Extent may be underestimated The EIS/A states that the geographic extent of the effect will be "regional", which is defined as "*effect occurs beyond the LSA but within the RSA*". However, because the boundaries for the cumulative effects assessment do not include the US portion of Lake Koocanusa, the full geographic extent of effects is not clear. Context may be underestimated The EIS/A states that the context will be "neutral", which implies that the receiving environment has some resilience to disruption. However, water quality in the Elk Valley has already been impacted by historical and ongoing mining activities in the region. It is unlikely that there would be much resilience to future impacts. Reference: Storb MB, Bussell AM, Caldwell Eldridge SL, Hirsch RM, Schmidt TS. Growth of Coal Mining Operations in the Elk River Valley (Canada) Linked to Increasing Solute Transport of Se, NO3-, and SO42- into the Transboundary Koocanusa Reservoir (USA-Canada). Environ Sci Technol. 2023 Nov 14;57(45):17465-17480. Doi: 10.1021/acs.est.3c05090.	
ECCC-IR-76	5(1)(a)(i) Fish and Fish Habitat	6.3.1 Fish and Fish Habitat	12.5 Fish and Fish Habitat Assessment – Project Effects Assessment	Page 12-79 of the EIS/A states "*B.C. WQG [water quality guideline] for the protection of aquatic life is the threshold for significance for fish and fish habitat health*." (p. 12-79). ECCC notes that typically, significance is based on the integration of the six residual effects criteria (CEAA 2018). However, if it is based on the BC WQG as stated in Section 12.5.1 of the Application, it is unclear why the changes in water quality to Fish and Fish Habitat were determined to be not significant when the EIS/A demonstrates that water quality exceeds BC water quality guidelines in West Alexander Creek (throughout the mine life and post-closure) and in Alexander Creek at AC-3 in 2026 (Appendix 11F). Reference: Canadian Environmental Assessment Agency (CEAA). 2018. Technical Guidance for Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act, 2012.	ECCC recommends that the EIS/A: a) clarify which thresholds are used to characterize the significance of the predicted water quality changes; and b) if BC water quality guidelines are to be used as a threshold for significance, present rationale as to why the identified exceedances are not considered significant.
ECCC-IR-77	5(1)(a)(i) Fish and Fish Habitat	6.3.1 Fish and Fish Habitat	12.5.4.1.3 Fish and Fish Habitat Assessment – Characterization of Residual Effects – Changes in Water Quality	Characterization of residual effects to Fish and Fish Habitat from changes in water quality may be underestimated. Duration may be underestimated The EIS/A states that the potential effects are "long-term". "Long-term" is defined as "*Effect lasts greater than 19 months and less than 34 years over the course of the Operations, Reclamation and Closure, and Post-Closure phases*" (Table 5.3-9). However, the potential for ML/ARD from the MRSF persists beyond the 34-year temporal boundary according to water quality model (Appendix 11F). Furthermore, in Chapter 11, the "Change in Surface Water Quality from Disposal of Mine Rock and Coal Rejects" and the "Change in Surface Water Quality from Surface Water-Groundwater Interactions" were both characterized as "Permanent". Magnitude may be underestimated The EIS/A characterization that the magnitude of the effect is "low" because tissue concentrations of selenium are predicted to remain below the guideline. "Low" is defined as "*change that is not likely to have a definable, detectable or measurable effect above baseline or is below established thresholds of acceptable change*" (Table 5.3-9). It is unclear whether water quality guidelines were taken into account for magnitude as well, and ECCC notes that predicted concentrations of selenium are above water quality guidelines in West Alexander Creek and Alexander Creek in the MRSF success scenario (so it is unlikely that the water quality change will remain below established guidelines). Additionally, the EIS/A underestimates several effects to aquatic life from water quality, including the following:	ECCC recommends that the Proponent justify or revise the characterization of residual effects to Fish and Fish Habitat from changes in water quality, in consideration of uncertainties in the duration, magnitude and geographic extent.

				a) MRSF failure model not modelled (see ECCC-IR-64) b) Nickel thresholds are greater than they should be (see ECCC-IR-61) c) Selenium bioaccumulation model has high uncertainty (see ECCC-IR-79). <u>Geographical extent may be underestimated</u> The Application states that the geographical extent is "local", meaning within the LSA. However, water quality effects in Michel Creek, the Elk River and Lake Koocanusa were not fully assessed (see ECCC-IR-57, ECCC-IR-58, and ECCC-IR-73) therefore the resulting impacts to fish may be underestimated.	
ECCC-IR-78	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	22.5.4.2.2 Human and Ecological Health Assessment – Potential Project Effects to Aquatic Wildlife Health Appendix 22B Supplementary Assessment of Selenium Bioaccumulation Risk to Fish	The EIS/A uses the US EPA selenium benchmark, instead of the recently developed Canadian Federal Environmental Quality Guideline (FEQG) for selenium, as screening criteria to determine effects to fish and fish habitat. Since the proposed Project occurs in Canada, the recently developed FEQG value (14.7 mg/kg dw) should be used as the screening criteria to assess effects.	ECCC recommends that the EIS/A use the selenium FEQG as screening criteria as a screening criteria in the assessment of effects of selenium on fish.
ECCC-IR-79	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	22.5.4.2.2 Human and Ecological Health Assessment – Potential Project Effects to Aquatic Wildlife Health Table 22.5-4 22.5.4.3.2 Human and Ecological Health Assessment – Characterization of Residual Effects – Aquatic Wildlife Health Appendix 22B Supplementary Assessment of Selenium Bioaccumulation Risk to Fish	The selenium bioaccumulation model may underestimate impacts to fish and other aquatic life, for the following reasons: a) The bioaccumulation model uses inputs that were developed for a different project, and does not validate bioaccumulation model predictions using site-specific water, periphyton, invertebrate and fish tissue data. This is particularly important given the insensitivity of the model at lower water concentrations (i.e., a range in aqueous concentrations of 0.85 ug/L and 8.79 ug/L translate to differences in egg selenium concentrations of just 0.04 mg/kg dw). b) Water quality concentration inputs to the bioaccumulation model do not reflect the range of variability in water quality predictions produced by the water quality model. For example, the upper bounds of variability in these water quality predictions are not accurately represented in the bioaccumulation model by the single maximum 30-day rolling average from four project phases (construction, operation, closure, and post-closure). c) Predicted fish tissue values (i.e., outputs) from the bioaccumulation model do not reflect the range of variability in input water concentrations. ECCC notes only one output value is provided with a confidence interval within the range of water quality data used as inputs to the bioaccumulation model (see Appendix 22B Figures 1-3). d) There is no consideration of selenium speciation or discussion of the limitations of the bioaccumulation model in terms of selenium speciation. The model does not take into account speciation and it is unclear what speciation is assumed. Selenate, selenite and organic forms of selenium have different rates of bioaccumulation. Further, there is no recognition that should the speciation of selenium change, the accuracy of model predictions will decrease.	ECCC recommends that the following information be added to the EIS/A: a) validation of the bioaccumulation model using site-specific data collected for water, periphyton, invertebrate, and fish tissue; b) maximum water quality concentrations used for fish tissue predictions, and/or confidence intervals for the water quality concentration input values, for each of the four project phases; c) confidence intervals fore fish tissue predictions which are reflective of underlying data used to develop 3-step model; and d) discussion on the limitations of the bioaccumulation model in terms of assumptions regarding selenium speciation.
ECCC-IR-80	5(1)(a)(i) Fish and Fish Habitat	6.4 Mitigation	33.4.1.6.6 Management and Monitoring Plans – Landform Design and Reclamation Plan – An Adaptive Management Strategy for	Contingency plans for the MRSF may not be effective. The MRSF represents perpetual storage for 270 million cubic meters of waste rock. This storage facility needs to remain suboxic (i.e., oxygen and water ingress restricted), possess sufficient carbon to support nitrate and selenium reduction, and remain without preferential flow paths, among other requirements, to remain an effective form of source control. If these requirements are not met, the MRSF could leach higher quantities of contaminants than anticipated. The EIS/A outlines contingency plans that can be put into place as the MRSF is being constructed, however, these will not be able to be applied retroactively (Chapter 33, p. 74). ECCC notes that MRSF failure may not be immediately apparent during the life of the mine, but	ECCC recommends that the EIS/A describe: a) how the MRSF will provide effective source control in perpetuity; b) whether surface water quality monitoring and groundwater quality monitoring will continue into closure and post-closure; and

			Controlling Selenium Production	may occur over decades, long after the mine closes. It is unclear what contingency measures could be implemented should the MRSF fail at a future date or slowly over time.	c) Any economically and technically feasible contingency mitigation measures that could be implemented during closure or post-closure.
ECCC-IR-81	5(1)(a)(i) Fish and Fish Habitat	6.6.3 Cumulative Effects Assessment	33.4.1.8.9 Management and Monitoring Plans – Site Water Management Plan – Individual Management Plans	It is unclear which water quality targets will be used for cumulative effects management in Michel Creek, noting: a) page 33-158 of the EIS/A states, "*The Project will adhere to the Water Quality Targets provided in the EVWQP to mitigate potential cumulative effects on water quality caused by the Project*", but b) page 33-158 of the EIS/A also states the Proponent would "*[work] with the provincial government and local indigenous Communities to establish long-term water quality targets for Michel Creek*".	ECCC recommends that the EIS/A clearly describe the approach for cumulative effects management in Michel Creek, including any applicable water quality targets.
ECCC-IR-82	5(1)(a)(i) Fish and Fish Habitat	6.3.1 Fish and Fish Habitat 6.4 Mitigation	33.4.1.8 Management and Monitoring Plans – Site Water Management Plan 11.5.4.1.1 Surface Water Quality Assessment Methods – Water Quality Model Appendix 11E Water Mitigation Technology Readiness Review Figure 22, 24, Section 3.3.7	No mitigation measures are identified in the EIS/A for the prevention of organic selenium generation in the interim and ultimate sedimentation ponds. Organic selenium is more bioavailable than inorganic selenium, and when generated in the sediment pond, can travel downstream and bioaccumulate in fish and invertebrates. ECCC understands that the interim and ultimate sedimentation ponds would be designed to treat high concentrations of suspended solids by removing the smallest particles, in accordance with the BC MOE (2015). To remove sediments, the sedimentation ponds require the formation of standing water. Shallow ponds with low retention times under warm weather conditions provide the ideal environment for the generation of organic selenium, given sufficient selenium and organic matter. Teck found that increases as little as 0.1 µg/L organoselenium are consistently associated with a discernable increase in selenium bioaccumulation (Adept Environmental Sciences 2021). <u>References:</u> Adept Environmental Sciences Ltd. 2021. Elk Valley Selenium Speciation Monitoring Program: 2021 Annual Report. Submitted to Teck Coal Limited. Dated April 14, 2022. British Columbia Ministry of Environment (ENV). 2015. Technical Guidance 7: Assessing the Design, Size, and Operation of Sediment Ponds Used in Mining. Environmental Protection Division, BC Ministry of Environment.	ECCC recommends that the EIS/A: a) describe measures to mitigate the generation of organic selenium in the proposed sedimentation ponds, and/or potential alternatives to sediment ponds, as appropriate; and b) outline the plans for monitoring and adaptive management of organoselenium generation in the sediment ponds and subsequent bioaccumulation in receiving environment biota.
ECCC-IR-83	5(1)(a)(i) Fish and Fish Habitat	6.4 Mitigation	33.4.1.8 Management and Monitoring Plans – Site Water Management Plan 33.4.1.6.6 Management and Monitoring Plans – Landform Design and Reclamation Plan – An Adaptive Management Strategy for Controlling Selenium Production	Page 33-163 of the EIS/A states, "*the contingency plans noted above have not been fully developed or assessed by NWP and their effects on Project success cannot be quantified at this time*". ECCC notes that contingency planning is especially important for the Project because the primary mitigation measure for water quality (i.e., the MRSF layer cake method) is considered an emerging technology (see ECCC-IR-51). A detailed plan that includes proven and effective contingency measures, is based on specific triggers, and can be quickly implemented, should be in place to protect the environment in case the MRSF does not work to the expected efficiency. However, the contingency plans presented in the EIS/A are lacking details on efficacy, feasibility, timelines, and specific triggers. For example: • Although active saturated rock fill and active treatment are also listed as contingencies in Section 2.5.7, the EIS/A supplies no details on these contingency measures in Chapter 33 (Management and Monitoring Plans). • The EIS/A does not indicate how long contingency mitigation measures would take to implement. It is unclear if these measures would be temporally feasible for a mine with a 16-year mine life. Given the limited details, it is unclear if these contingency measures are sufficiently developed to be put into place promptly and successfully should the MRSF prove ineffective when scaled up to operational levels. It is therefore unclear whether these contingency plans are effective, proven, and timely enough to mitigation potential Project effects.	ECCC recommends that the EIS/A include a fully developed contingency plan that details proven mitigation measures, timelines, and triggers for implementation. The contingency plan should demonstrate that effects to water quality and related Valued Components (e.g., Fish and Fish Habitat) would remain the same as those assessed within the EIS/A even if the MRSF does not work to its expected efficiency; otherwise, the effects assessments may need to be revised accordingly.
ECCC-IR-84	5(1)(a)(i) Fish and Fish Habitat	8.2 Monitoring	33.4.1.8 Management and Monitoring Plans – Site Water Management Plan	It is unclear whether the proposed water quality monitoring program will be able to verify the accuracy of the environmental assessment, determine the effectiveness of mitigation measures, and ensure that effects remain within the range predicted by the assessment.	ECCC recommends that the EIS/A include the following information on the water quality follow-up monitoring program: a) Locations of surface and groundwater quality monitoring.

					b) Revise or provide a rationale for the tolerance levels identified for initiating follow-up investigation for selenium. The EIS/A proposes selenium tolerance levels of *">0.01 mg/L (average) and 0.02 mg/L (grab)*" (p. 33-104), but these are much higher than the concentrations predicted in the EIS/A for the Project (Appendix 11F). It is unclear how these thresholds will ensure that Project effects remain within the range of predictions presented in the EIS/A. c) Monitoring plans for organoselenium species. These species form in sedimentation ponds and are highly bioaccumulative, however they are not listed in the "Suite of Analyses" (p. 33-103); and d) Description of how gradual changes will be assessed the by monitoring program. The follow-up investigation tolerance is more than +/- 20% of previous reading. This would catch sudden changes; however, it is unclear if gradual increases or decreases over time will be investigated.
ECCC-IR-85	5(1)(a)(i) Fish and Fish Habitat	8.2 Monitoring	33.4.1.5 Management and Monitoring Plans – Fish and Fish Habitat Management Plan	It is unclear whether the proposed aquatic effects monitoring program will be able to verify the accuracy of the environmental assessment, determine the effectiveness of mitigation measures, and ensure that effects remain within the range predicted by the assessment. ECCC also notes that the frequency of aquatic health sampling is described as "periodic as required" for Operations through to Post-Closure (Tables 33.4-15 and 33.4-16).	ECCC recommends that the EIS/A include the following information on the aquatic effects monitoring follow up program: a) frequency of tissue sampling for each organism type- periphyton, benthic invertebrates, and fish; b) frequency of fish egg sampling; c) the meaning of "periodic as required" and a description of how this frequency of sampling will verify the accuracy of the effects assessment; and d) sampling in Michel Creek, Elk River, and Lake Koocanusa.
ECCC-IR-86	5(1)(b) Federal Lands / Transboundary	2.2 Alternative Means of carrying out the project	2.5.1.6 Project Alternatives – Mine Equipment Selection Page 2-17	The EIS/A indicates the mine equipment selection process looked at the equipment fleets at other coal mines in the Elk Valley in addition to coal mines in northeast B.C. The primary Project decision for mine equipment focused on how the shovels and drills are powered. Mobile fleet emissions represent the largest source (60%) of GHG emissions associated with the Project. ECCC considers electrification of mobile fleets to be an important pathway to decarbonization that should be considered by the Proponent to mitigate Project effects. However, the assessment of alternative means of carrying out the Project does not consider alternative mobile fleet decarbonization technologies that are economically and technically feasible, such as battery-electric vehicles, low-carbon fuels such as biodiesel or LNG blended engines, and trolley-assist technology.	ECCC recommends that the assessment of alternative means of carrying out the project include an evaluation of mobile fleet decarbonization technologies, including those available for haul trucks.
ECCC-IR-87	5(1)(b) Federal Lands / Transboundary	8.1 Follow-up Program	33.4.1.1.8 Management and Monitoring Plans – Greenhouse Gas Mitigation Measures Page 33-13	The EIS/A chapter on air quality and GHG management and monitoring programs indicates the Proponent will investigate the possibility of using zero-emission electric vehicles and low emission vehicles as part of its fleet; however, these technologies were not considered in the assessment of alternative means of carrying out the Project.	ECCC recommends that the EIS/A describe how, when, and which technologies the Proponent will consider in their investigation of zero-emission electric vehicles and low emission vehicles as part of their fleet. ECCC recommends this be conducted as part of the assessment of alternative means of carrying out the Project.
ECCC-IR-88		6.5 Significance of residual effects	6.6.6.1.4 Atmospheric Environment Assessment – Change in Ambient	The EIS/A indicates that predicted exceedances of some BC ambient air quality objectives (AAQOs) are mostly concentrated within 2 km of the Project footprint, where no permanent residences exist. While it is possible that people or wildlife could be occasionally exposed to such concentrations, a continuous exposure would not be expected. Therefore, the residual effects of the Project from a change in ambient criteria air contaminant concentrations were characterized as not significant.	ECCC recommends that the EIS/A identify additional mitigation measures (e.g., existing technologies, best practices, etc.), and implement ongoing monitoring and management to address the predicted exceedances of BC AAQOs and issues related to dust management.

			Criteria Air Contaminant Concentrations Page 6-79	ECCC notes that dust management in this region is an ongoing issue with potential environmental and health impacts to the surrounding areas, such that Teck Resources Ltd. has been conducting ongoing monitoring and dust mitigation in the area (Teck 2023). Current and emerging best practices for dust management may help mitigate Project effects related to dust management. Reference: Teck Resources Ltd. 2023. Dust Management in the Elk Valley. https://www.teck.com/news/stories/2023/dust-management-in-the-elk-valley	
ECCC-IR-89	5(1)(a)(i) Fish and Fish Habitat	6.6.2 Effects of the Environment on the Project	Appendix 20A Climate Change Impact Assessment	The EIS/A indicates that the effects of climate change on hazards related to heavy precipitation events, such as flooding or road washouts, can lead to erosion and sediment deposition in downstream areas (i.e., impacts to fish and fish habitat). As such, access and haul roads are to be constructed with proper drainage and storm water management systems for the region. Drought conditions are expected to pose a risk to the proper functioning of the sedimentation pond, but these effects have not been well characterized in the EIS/A. Environmental compliance monitoring is expected to take place continuously throughout the project and mitigation measures will be implemented as necessary. Information detailing the anticipated impact of climate change on the stormwater management system, including the sedimentation pond, has not be provided. Furthermore, the environmental monitoring and mitigation measures for water quantity are not described.	ECCC recommends that the EIS/A include additional details on the anticipated effects of climate change on Project hydrology and describe how related uncertainties are taken into account in the determination of Project effects, adaptive management plans, and design of mine infrastructure (i.e., ponds, haul roads, etc.).
ECCC-IR-90	5(1)(a)(i) Fish and Fish Habitat	6.6.2 Effects of the Environment on the Project	Appendix 20 Climate Change Impact Assessment	Appendix 20B presents a table that lists the identified climate risks for the Project. ECCC notes that some risks described in Appendix 20A are not included in the table in Appendix 20B. Additionally, the list of recommended adaptation measures in Appendix 20C does not provide measures for all risks identified for the Project.	ECCC recommends that the Proponent update Appendix 20B to include all risks associated with climate change that are identified in Appendix 20A. ECCC also recommends that Appendix 20C include recommended adaptation measures for each of the risks highlighted in Appendix 20B.
ECCC-IR-91	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	Chapter 10 Surface Water Quantity Assessment	Sedimentation basins and sediment ponds are important measures for mitigating potential turbidity impacts downstream of a project. They must be sized appropriately to detain a certain magnitude of flow while allowing fine sediments to settle. Typically, they are sized based on a rainfall intensity (mm/hr) of a certain return period for a duration correlated to the site characteristics. For example, smaller or steeper watersheds would use a shorter duration storm because the time of concentration or, the lag time for rainfall to reach the watershed outlet is shorter. For a given return period, shorter duration storms have higher intensities, and result in higher flow rates. Section 3.7.5.4 of the EIS/A indicates that the sizing of the sedimentation basin sizing was done based on provincial guidelines (Alberta Transportation 2011), which could not be located by ECCC. The EIS/A also indicates that the sizing of the interim and main sediment ponds was done in accordance with BC MOE (2015), which recommends a 10-year 24-hour storm event (Section 3.7.5.5 of EIS/A). BC MOE (2015) also recommends a 200-year 24-hour storm event for the spillway. The site-specific lag time of the West Alexander Creek watershed (Table 3.7-11 of the EIS/A) ranges from 40-100 minutes, which is smaller compared to 24-hours recommended by BC MOE (2015). The sizing of the sediment pond is based on a 10-year, 24-hours storm event yielding 55.3 mm precipitation. The rainfall intensity for that event is estimated to be around 2 mm/hr. If the duration of the storm is reduced from 24 hours to a duration closer to the lag time of the watershed (roughly 2 hours), the rainfall intensity would increase substantially to around 9 mm/hr (historical IDF curve for ECCC Sparwood Climate Station). Other types of peak flow events, such as rain on snow flooding, are significant source of flooding in mountainous areas such as this mine site. It is not clear if these other types of events were evaluated when sizing the pond. The main sedimentation pond is projected to be used into the 2040s, however its design does not incorporate the expected increase in extreme precipitation magnitudes and frequencies due to climate change. BC MOE (2015) section 4 states "*increased volatility/frequency of storm events due to changing climate should be considered*".	ECCC recommends that the EIS/A: a) Provide details on the selection of the design storm parameters (storm intensity and duration) and its impact on pond design, including: i. pond capacity to collect and retain storm water; and ii. impacts on erosion and sedimentation potential in the pond. b) Clarify if other types of peak flow events, such those resulting from rain or snow flooding were considered in the design of the pond. c) Describe if and how the effects of climate change are taken into consideration in the design of the pond.

				Reference British Columbia Ministry of Environment. (2015). Technical guidance 7 Environmental Management Act: Assessing the design, size, and operation of sediment ponds used in mining. Version 1.0. https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/mining-smelt-energy/assessing_design_size_and_operation_of_sediment_ponds.pdf	
ECCC-IR-92	5(1)(a)(i) Fish and Fish Habitat	6.2.2 Changes to Groundwater and Surface Water	Chapter 10 Surface Water Quantity Assessment	Insufficient details are provided in the EIS/A to support the quality and validity of the baseline information for water quantity, and ECCC identified many inaccuracies and inconsistencies in the information that is provided. It is unclear if and how the baseline hydrometric information was used to inform other sections of the EIS/A. ECCC notes the following: • Stations A3, A3B, A1, and G2 all use rating curves based on measurements at low flows to extrapolate estimated flows 10-40 times higher. Water Survey of Canada (WSC) Standard Operating Procedures recommends only extrapolating 2x. • The values of the monthly and annual averages, as well as peak flows at station A1, are reported to be lower than the values at station A3B, which is located upstream of A1. No explanation is provided to explain this inconsistency. • Section 5.2.1.5 describes a regression relationship with WSC stations used to infill data gaps in the LSA hydrometric stations but does not indicate how much data was infilled. • The rating curve for WA1 appears appropriate for the range of estimated flows, but still has very limited data (~4 years, 2012-2016). • Only stations A1 and G2 are reported to have “ongoing” monitoring. Given that Appendix 10A was written in 2020, it’s unclear if those stations are still active and whether the rating curves have improved. In section 33.4.1.8.9 it is indicated that all baseline hydrometric stations were discontinued by 2019. • It is unclear which streamflow data were used to validate the modelling results in section 33.4.1.8.9 of EIS/A. • The proposed hydrometric monitoring locations in Table 10.7-1 do not include monitoring locations in West Alexander Creek, where the EIS/A identifies potential impacts to water quantity at various timescales. • The proposed hydrometric monitoring locations are far downstream of the mine site and as a result project effects may be indistinguishable from the natural variability.	ECCC recommends that the Proponent: a) clarify which streamflow data was used to calibrate and validate water balance models, water quality models and water management plans; b) describe how surface water quantity data was collected (i.e., measurement technique, rating curve, etc.); and c) provide information supporting the quality of the data.

ANNEX 3: Advice to the Proponent

Table 3: Additional advice to the Proponent, such as guidance or standard advice related to your departmental mandate

Departmental number (e.g. HC-01)	Reference to EIS/A/A Section	Context and Rationale	Advice to the Proponent
ECCC-93	15.6.2.2 Bat Community – Baseline Programs	Acoustic and live capture sites are strongly biased to little brown myotis detections. The Mammal Report (Appendix 15 B Baseline Survey Report Mammals) acknowledges the targeting of live capture to little brown Myotis is an important data gap, but does not acknowledge this information gap for acoustic sampling. This bias becomes problematic when acoustic data results are interpreted as northern myotis and red bats being present in relatively low abundances. Although there is a relationship between echolocation activity and abundance, this relationship is dependent on a number of factors (e.g., species-specific detection probabilities, site type being sampled such as open areas vs. forest interior, etc.) such that bat population abundance should not be inferred from acoustic activity levels alone, particularly when making inferences that these two species are present in low abundance at a site. With northern myotis being detected, additional acoustic sampling to assess presence of northern myotis (or other species) is recommended in the strata of forest stands identified as ESSFdk1. This Biogeoclimatic Ecosystem Classification variant of forest stands composes the majority of the Project footprint and would be lost to mining operations (see ECCC-94 below about flexibility in forest stand use across the species range in discussion of modelling). Further, acoustic sampling occurred at sites ranging from one to 18 nights, primarily in one summer season with a few additional nights in autumn/winter. This represents a low effort overall in relation to making recommendations on habitat use and seasonal patterns in activity and habitat use. It is recommended to have sampling occur year-round (e.g., minimum of one full year) to effectively assess seasonal patterns of activity.	ECCC recommends that the Proponent consider increased and alternative sampling protocols for assessing the presence and abundance of species other than little brown myotis, or otherwise account for potential underestimation of the abundance of other at-risk bat species.
ECCC-94	Appendix 15 C, section 1.2.5.14 Bat Modeling	Using little brown myotis data to assess at-risk bat habitat needs, availability, and loss for Northern myotis introduces uncertainty into the assessment. Northern myotis maternity colonies are typically smaller in size, meaning they may be able to use different forest stands that contain different tree species, trees with smaller overall diameter at breast heights, or trees in lower decays classes than little brown myotis. They also occupy northern boreal forests in other parts of their range where stands may be dominated by smaller sized coniferous species in more open canopy stands, which could be analogous to higher elevation forest stands at more southerly latitudes. ECCC notes that the Project footprint has high forest cover of “Medium” ranked habitat, which could be habitat for northern myotis that will be lost to mining operations. The habitat assessment may produce different results if metrics included the rating scheme habitat ranked as “Medium” (2), in addition to “High” (1).	ECCC recommends that the Proponent consider alternative classifications for habitat rankings given the uncertainty around Northern myotis habitat use in this area of BC.
ECCC-95	15.6 Bat Community	Silver-haired, hoary and eastern red bats have been assessed by COSEWIC as endangered (2023) and are currently under consideration for addition on Schedule 1 (listing as endangered) under SARA. Acoustic surveys detected these species at the Project site, and hoary and silver-haired bats were also confirmed through live capture. Silver-haired bats were detected in autumn/winter acoustic surveys. and recent work (de Freitas 2023, Lausen et al. 2022) has described silver-haired bat winter hibernacula as including several species of trees, in addition to underground sites, in southern British Columbia. Current considerations for winter hibernacula in the assessment are biased to underground sites only (rock; primarily for little brown myotis). References: de Freitas, E. 2023. Winter roosting ecology of silver-haired bats (*Lasionycteris noctivagans*) in southern British Columbia. doi: https://doi.org/10.24124/2023/59414 Lausen, C. L. L., D. W. Nagorsen, R. M. Brigham, and J. Hobbs. 2022. Bats of British Columbia, 2nd Edition. Royal Museum of British Columbia, Victoria, British Columbia, Canada.	ECCC recommends that the Proponent consider the potential for Project effects on tree-based hibernacula for silver-haired, hoary and eastern red bats.
ECCC-96	Appendix 15 C, section 1.2.5.14 Bat Modeling	The karst layer of the Digital Elevation Model (DEM) may omit rocky outcrops that are of different rock types (e.g., non-karst) and thus be biased to cave structures. Further, it is possible rocky substrates may be missed in the DEM by applying the filter of >= 0.3 high terrain ruggedness. Rock hibernation sites are only recently being described for little brown and northern myotis in western North America, but in some cases appear in more gently sloped areas (depending on the rock substrate type) and are not restricted to only large talus or scree fields associated with highly steep terrain.	ECCC recommends that the Proponent consider the potential suitability of other rock hibernation sites for at-risk bat species.

ECCC-97	15.7.2 Bird Community – Existing Conditions	Methods presented in the EIS/A may not accurately estimate known occurrences and abundance of migratory birds. ECCC notes the following: • In western North America, birds make regular post-breeding movements from lower elevation to high elevation areas to take advantage of later pulses of food availability. Surveys were not conducted to evaluate avian use of the Project area during this period, therefore effects on lower elevation breeding birds are unknown. • There is high within-season variability in migratory movements, so surveys conducted during fall migration are insufficient to evaluate abundance and distribution of birds using the Project area for fall migratory stopovers. High mountain ridges and valleys funnel bird migratory movements and therefore large numbers of avian migrants may also fly over or near the Project site. • Nocturnal passage migrants are highly vulnerable to light attraction, disorientation and collisions with structures due to floodlighting during nighttime mining operations. • Traditional point count surveys and transects do a poor job of surveying Black Swifts, because of low detectability. This species requires specialized surveys (Levesque et al. 2023, Rock et al. 2021) and therefore their presence is likely underestimated. <u>References:</u> Levesque, P.G., Feldman, R.E., Rock, C.A. and Gross, W.E., 2023. Optimizing survey timing for detecting a declining aerial insectivore, the Black Swift (Cypseloides niger borealis). Avian Conservation and Ecology, 18(2). Rock, C., P. G. Levesque, and W. E. Gross. 2021. Black swift survey protocols in Canada: site occupancy, nest searching, and site habitat. Environment Canada, Canadian Wildlife Service, Delta, British Columbia, Canada. https://doi.org/10.13140/RG.2.2.21197.36322/1	ECCC recommends that the Proponent consider shortcomings in the methods used to estimate known occurrence and abundance of migratory birds, and account for these uncertainties in the assessment of Project effects. For Black Swifts specifically, ECCC recommends the Proponent to consider specialized survey protocols (Levesque et al. 2023, Rock et al. 2021).
ECCC-98	15.7.2.3 Bird Community - Modeling	The EIS/A indicates that Barn Swallows are not expected to be affected by disturbance, as the species will likely not occur near the Project footprint due to a lack of "*barns, houses or garages*". However, bridges and culverts are present, and these can be quickly colonized by one or more pairs. Equipment and other structures are likely to also be present within the Project footprint and the LSA that could attract nesting Barn Swallows.	ECCC recommends that the Proponent consider the possibility of barn swallow presence, including barn swallow nests, in the LSA and potential impacts of disturbance on barn swallow habitat.
ECCC-99	15.7.3.2 Bird Community – Project Effects	The risk of feather soiling and drowning by migrant waterfowl in sedimentation ponds is not addressed as a possible source of mortality. ECCC notes that measures to exclude waterfowl from contaminated open ponds are challenging to successfully implement.	ECCC recommends that the Proponent consider feather soiling and drowning in sedimentation ponds as a possible source of mortality from the Project.
ECCC-100	15.7.2 Bird Community – Existing Conditions	Occurrence records of species at risk, such as Olive-sided Flycatcher, indicate high local suitability of habitat both within the Project footprint and surrounding Local Study Area. These patterns of habitat use do not seem to be well captured by the habitat occupancy model used by the Proponent that is the basis of their effects assessment. For example, according to Appendix 15-E Figure 3-2 there are a high number of observations of Olive-sided Flycatcher immediately north of Gaff Peak, however this area is classified as Low and Moderate habitat suitability in Figure 15.7-17.	ECCC recommends that the Proponent provide further information related to the performance of habitat occupancy models for Olive-sided Flycatcher, including explanations for why areas with multiple observations are not classified as high suitability habitat.
ECCC-101	15.5.1.1.3 Carnivore Community – Regulatory and Policy Considerations – American Badger	The EIS/A references the Recovery Strategy for the American Badger in British Columbia (2016) developed by the Province of BC in Section 15.5.1, and not the more recently published federal Recovery Strategy for the American Badger *jeffersonii* subspecies (*Taxidea taxus jeffersonii*) Western population and Eastern population in Canada (ECCC 2021). <u>Reference:</u> Environment and Climate Change Canada. 2021. Recovery Strategy for the American Badger *jeffersonii* subspecies (*Taxidea taxus jeffersonii*) Western population and Eastern population in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. 2 parts, 20 pp. + 36 pp. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/american-badger-west-east-proposed-2021.html#toc1	ECCC recommends that the EIS/A reference the more recent federal Recovery Strategy for the American Badger *jeffersonii* subspecies (*Taxidea taxus jeffersonii*) Western population and Eastern population in Canada (ECCC 2021). This document should also be consulted to confirm whether the data, methods, and objectives set out in the EIS/A are consistent with the Recovery Strategy.
ECCC-102	15.5.2.2.1 Carnivore Community – Baseline Programs – Summary of Methods	Table 15.5-8 of the EIS/A states that badger burrow surveys were conducted in July and August and that hair snagging surveys were conducted between January and May. The EIS/A also references Resources Information Standards Committee (RISC) survey standards from 1999. These methods do not reflect updated RISC standards for badgers (RISC 2007), which states that the probability of detecting badger burrows is highest in early spring when snow has melted, and vegetation has not grown to obscure the burrow. It also recommends that the most appropriate season to snag hair is from mid-spring to late summer when badgers shed their winter hair and their movements between burrows are more frequent. ECCC notes the EIS/A states "*there were no active or recently used burrows, or burrows indicative of maternal denning found within the Project footprint*", however results in Table 15.5-14 indicate that 10 active burrows and 73 inactive burrows were observed in the LSA.	ECCC recommends that survey methods follow guidance outlined in the most recent version of RISC standards for badger published in 2007. ECCC recommends additional American badger surveys be conducted (according to the methods outlined in RISC 2007) to verify the finding that no active or recently used burrows, or burrows indicative of maternal denning, were found within the Project footprint.

		Additional surveys for American method using RISC 2007 methods would provide a more accurate understanding of the American badger presence and use of the Project footprint and LSA. Reference: Ministry of Environment Ecosystems Branch for the Resources Information Standards Committee. 2007. Inventory Methods for Medium-sized Territorial Carnivores: Badger. Standards for Components of British Columbia's Biodiversity No. 25a. Available at: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/badger.pdf	
ECCC-103	15.5.3.1 Carnivore Community – Project Effects Assessment – Thresholds for Determining Significance of Residual Effects	Page 15-204 of the EIS/A states "*a significant adverse residual environmental effect on the carnivore community is one where the Project:* • *Causes the non-permitted contravention of any of the prohibitions stated in Sections 32 to 36 of the Species at Risk Act including injury, harassment, or mortality of a carnivore species at risk;* • *Results in the non-permitted loss of critical habitat for carnivore species at risk; or* • *Causes a decline in abundance or change in distribution of carnivore populations such that the populations will not be sustainable in the Terrestrial or Grizzly Bear RSA*." ECCC notes that the Project footprint overlaps with Final Critical Habitat for American badger *jeffersonii* subspecies (ECCC 2021), and these impacts should be considered in the significance determination for residual adverse environmental effects. Reference: Environment and Climate Change Canada. 2021. Recovery Strategy for the American Badger *jeffersonii* subspecies (*Taxidea taxus jeffersonii*) Western population and Eastern population in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. 2 parts, 20 pp. + 36 pp. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/american-badger-west-east-proposed-2021.html#toc1	ECCC recommends that the significance determination for American badger consider the loss of Critical Habitat as identified in the Recovery Strategy (ECCC 2021).
ECCC-104	15.5.3.2.1 Carnivore Community – Project Effects Assessment – Project Interactions	Page 15-205 the EIS/A states, "*the key interactions resulting in potential significant adverse effect or significant concern (indicated as level III in Table 15.5-25) are primarily those involving habitat loss or alteration*." Activities related to transportation and ground disturbance are not included as level lll in Table 15.5-25, however ECCC notes that grizzly bears are at risk of increased mortality and decreased habitat connectivity from increases in mine-related traffic throughout the life of the mine. Also, activities involving ground disturbance and excavation increases the risk of mortality for American badger and wolverine, and their prey, and will result in habitat loss.	ECCC recommends that activities related to transportation, road construction, and ground disturbance be considered a significant concern (level lll) in Table 15.5-25 for carnivores adversely impacted by: • traffic (e.g. grizzly bear and American badger); and • ground disturbances including, but not limited to, excavation (e.g. American badger and wolverine).
ECCC-105	15.5.3.2.3 Carnivore Community – Project Effects Assessment – Discussion of Potential Effects	Page 15-216 of the EIS/A states, "*tall and steep snowbanks from snow clearing along access roads may be a barrier to carnivore VCs in the winter*." ECCC notes that mitigation measures such as clearing gaps in snow banks to allow wildlife to cross at identified wildlife corridors can prevent changes in movement and loss of habitat connectivity for carnivore VCs.	ECCC recommends that additional mitigation measures be implemented to reduce barriers to carnivore VCs resulting from snowbanks, such as clearing gaps to allow wildlife to cross at identified wildlife corridors.
ECCC-106	15.5.3.2.3 Carnivore Community – Project Effects Assessment – Discussion of Potential Effects	Page 15-217 of the EIS/A states, "*public access along Grave Creek Road will be maintained during all Project phases and after closure. This may provide increased access to hunters*."	ECCC recommends that the Proponent consider additional measures (e.g. signage, gates, road blocks, etc.) to mitigate Project effects to grizzly bears resulting from human-grizzly bear interactions and hunting.
ECCC-107	15.5.3.3.1 Carnivore Community – Project Effects Assessment – Mitigation Measures for Habitat Loss and Degradation	Page 15-219 of the EIS/A states, "*the mitigation measures described above will contribute to minimizing the effects of habitat loss and degradation on carnivore VCs with moderate effectiveness. These measures will not eliminate all effects and there will be a residual effect of habitat loss and degradation on carnivore VCs as a result of the Project*." Habitat offsetting can be implemented for residual effects to habitat loss and degradation. The Operational Framework for the Use of Conservation Allowances (Environment Canada 2012; hereafter the Framework) sets the parameters, based on existing legislated authorities, practice and policy, for how and when conservation allowances (offsets) should be used or recommended by ECCC. The Framework states that the choice of ratio for each offset proposal is case-specific and should be at least 2:1 and "*there will be instances where much higher ratios are appropriate*". ECCC typically recommends a minimum offset multiplier of 4:1 (offset outcome:residual impact). This is a benchmark ratio applied to a project that is in the lower end of the risk spectrum; for example, for a project with a low severity impact adversely affecting a low vulnerability ecological component. In general, the minimum 4:1 multiplier accounts for time-lags to restoration, uncertainty in outcomes, a precautionary approach, and the adverse impact itself in its specific context. Offset multipliers are variable and determined by project-specific circumstances and associated risks and uncertainties. Note that American badger is listed as Endangered under SARA and therefore all offsetting actions should be consistent with the species' Recovery Strategy.	ECCC recommends that, in addition to existing mitigation measures, habitat offsetting be implemented for grizzly bear and American badger habitat loss and degradation.

		References: Environment Canada. 2012. Operational Framework for Use of Conservation Allowances. Available at: https://publications.gc.ca/site/eng/9.696852/publication.html	
ECCC-108	15.5.3.3.4 Carnivore Community – Project Effects Assessment – Mitigation Measures for Increased Mortality Risk	Page 15-222 of the EIS/A states "*prior to blasting at pits, the blast area will be searched for the presence and wildlife and cleared from the area, if necessary*;" as a measure to mitigate the impact of increased mortality risk on carnivore VCs.	ECCC recommends that all wildlife surveys be conducted by a qualified environmental professional with the relevant experience in a field related to the species being surveyed.
ECCC-109	15.5.5.3 Carnivore Community – Follow-Up Strategy	Tables 15.5-2, 15.5-3, 15.5-4, and 15.5-5 of the EIS/A include recommended guidelines for management of grizzly bear, wolverine, and American badger, based on various land use plans for the region, best management practices, and government guidance documents. However, several of these recommendations have not been included in the mitigation measures described in Section 15.5.3.3	ECCC recommends all feasible best practices and mitigation measures outlined in Tables 15.5-2, 15.5-3, 15.5-4, and 15.5-5 be included in Section 15.5.3.3 of the EIS/A, or a rationale provided for their exclusion.
ECCC-110	15.5.3.4.2 Carnivore Community – Characterization of Residual Effects, Significance, Likelihood, and Confidence – Grizzly Bear	On page 15-230 of the EIS/A, the magnitude of the residual effect of habitat loss and degradation on grizzly bear is stated as "*low, there will be up [to] 3.7% loss of high-quality grizzly bear habitat (fall) in the Terrestrial LSA.*" ECCC notes that the assessment of magnitude has only taken into consideration impacts to fall habitat, though there are additional losses to spring and summer habitat up to 3.3% and 2.2% respectively (Table 15.5-28).	ECCC recommends that the characterization of residual effects to grizzly bear from habitat loss and degradation consider Project effects on all habitat types.
ECCC-111	15.5.3.4.2 Carnivore Community – Characterization of Residual Effects, Significance, Likelihood, and Confidence – Grizzly Bear	Page 15-230 of the EIS/A states that the geographic extent of the effects to grizzly bear from habitat loss were categorized as "*discrete, as the effect of habitat loss will be within the Project footprint only*." ECCC notes that the Project footprint itself is large and encompasses an entire drainage basin over 1000 ha (1282 ha). In addition, there may be indirect effects of loss of habitat that extend beyond the Project footprint into the LSA. These effects could be considered "local" in their extent, given local effects are defined as, "*the effect will extend outside the Project footprint but within the Terrestrial LSA*".	ECCC recommends the characterization of geographic extent for loss of grizzly bear habitat consider the potential for Project effects occurring beyond the Project footprint and into the Terrestrial LSA.
ECCC-112	15.5.3.4.2 Carnivore Community – Characterization of Residual Effects, Significance, Likelihood, and Confidence – Grizzly Bear	Page 15-235 of the EIS/A states: "*The Terrestrial LSA has approximately 317.9 km of existing roads. This includes 2.4 km of highway, 1.8 km of paved, and 313 km of gravel roads. This is a road density of 1.31 km/ km2… The total amount of new linear disturbance is therefore 5.9 km. This represents 1.9% of additional linear disturbance in the Terrestrial LSA*." The magnitude of the residual effect to grizzly bear from disruption to movement is then characterized as "*Moderate, given the semi-permeable nature of the linear infrastructure*." ECCC notes that existing linear feature density in the Elk Valley is already over the threshold for grizzly bear requirements, and that an additional 1.9% of new linear disturbance will cumulatively impact movement and habitat connectivity. As stated in Section 15.5.2.1.1 on page 15-160 of the EIS/A, "*A road density threshold of 0.6 km/km2 is the established maximum value that should not be exceeded to maintain grizzly bear habitat values (including security and movement; Proctor et al., 2018). The majority of sub-basin watersheds in the central and southern portions of the Elk Valley exceed a road density of 1.2 km/km2 (Mowat et al., 2018).*" Construction of new roads, conveyor belts, and transmission lines, as proposed, may adversely impact the habitat connectivity for grizzly bears specifically between areas of very high habitat suitability on the north and south sides of the proposed Grave Creek Road.	ECCC recommends that the characterization of magnitude of residual effects to grizzly bear from disruption to movement consider the maximum recommended road density threshold of 0.6 km/km^2.
ECCC-113	15.5.3.4.4 Carnivore Community – Characterization of Residual Effects, Significance, Likelihood, and Confidence – American Badger	ECCC notes the following discrepancy in the EIS/A regarding American badger habitat use: • Page 15-249: "*American badger generally avoid areas with high road density*." • Page 15-165: "*American badgers use roadsides because these habitats offer friable soils for burrowing and quality forage (grass) that their prey are attracted to (Weir et al., 2004; COSEWIC, 2012b; Klafki, 2014). Roads facilitate movements and cut banks expose soil deposits that are readily used for burrowing (COSEWIC, 2012b; Klafki, 2014). Since American badgers frequently use roadsides for denning and foraging, it increases the vehicle collision morality risk to individuals when roads are built in their habitat*." ECCC notes that American badgers are known to occur near roadways due to the favourable soil conditions, prey availability, and exposed cut banks, as noted on page 15-165 of the EIS/A and in the Recovery Strategy for American badger (ECCC 2021). American badger have also been observed in the Project footprint along Grave Creek Road. Reference: Environment and Climate Change Canada. 2021. Recovery Strategy for the American Badger *jeffersonii* subspecies (*Taxidea taxus jeffersonii*) Western population and Eastern population in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment	ECCC recommends that the characterization of residual effects to American badger from disruption of movement and mortality risk from vehicle collision consider badger use of new and existing roadsides for denning, finding prey, and movement.

		and Climate Change Canada, Ottawa. 2 parts, 20 pp. + 36 pp. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/american-badger-west-east-proposed-2021.html#toc1	
ECCC-114	15.5.4.2 Carnivore Community – Cumulative Effects Assessment – Temporal Boundaries 14.7.3 Cumulative Effects Assessment – Identifying Past, Present, and Reasonably Foreseeable Projects and/or Activities	Page 15-274 of the EIS/A states: "*As noted in Chapter 5, Section 5.3.5.3, the following projects were considered as past, present, or reasonably foreseeable future projects or activities in the cumulative effects assessment but were not included:* • *Coal Mountain Phase 2, as the environmental assessment was placed on hold by Teck Coal Limited in 2016;* • *Mount Brussilof (Baymag Mine) by Baymag, due to no temporal overlap;* • *Barnes Lake Phosphate Exploration Project by Fertoz International Inc., given that the project is in exploration phase and no project has been proposed; and* • *Cabin Ridge Coal by Warburton Group is in exploration and no project has been proposed*." Page 14-88 of the EIS/A references includes a similar statement. ECCC notes that projects that are proposed, under review, or are foreseen to be proposed may have undertaken activities during the exploration phase that could be harmful to vegetation and wildlife VCs, such as clearing or blasting of test sites, and may contribute to cumulative effects. For example, the Baymag Mine appears to have been recently or currently operational, and given the time required for restoration activities for this Project, ECCC is of the view that the Baymag Mine should be considered a past or current project that may contribute to cumulative effects on both the wildlife and vegetation VCs.	ECCC recommends that the cumulative effects assessments for vegetation and wildlife VC's consider activities undertaken by past, present, or reasonably foreseeable future projects that may contribute to cumulative effects for these VCs.
ECCC-115	15.5.4.4.2 Carnivore Community – Cumulative Effects Assessment – Grizzly Bear	In the Proponent's characterization of residual cumulative effects to grizzly bear from disruption to movement, page 15-286 of the EIS/A states "*while each of the existing and reasonably foreseeable future projects and activities may block movements to varying degrees, they are geographically separated from the Crown Mountain Coking Coal Project such that additive barriers with the Project are limited*". ECCC notes, and as stated in Section 15.5.2.1.1 of the EIS/A, the linear feature density in the Elk Valley is already twice the recommended maximum road density threshold of 0.6 km/km^2 required to maintain grizzly bear habitat values (including security and movement; Proctor et al., 2018). The majority of sub-basin watersheds in the central and southern portions of the Elk Valley exceed a road density of 1.2 km/km^2 (Mowat et al., 2018). ECCC is of the view that any additional linear features will be additive. Furthermore, Figure 15.5-34 demonstrates that several mines are oriented in a north/south direction with small gaps in between. The addition of the Project may reduce size of the central most gap in this series of mines, increasing the likelihood that grizzly bear will avoid this area and possibly limit east to west movement across the region.	ECCC recommends the Proponent consider the Project's additive impact to linear feature density as well as the geographical addition of the Project in relation to other mines in the region, with respect to characterizing residual cumulative effects to grizzly bear from disruption to movement. In considering this, ECCC recommends the Proponent describe if/how the characterization of residual cumulative effects changes, and if there is any change to the significance determination for grizzly bear.
ECCC-116	21.4.2.2 Release of Hazardous Materials – Mitigation Measures 21.4.2.3.6 Characterization of Residual Effects – Terrestrial Ecosystems and Vegetation 21.4.2.3.7 Characterization of Residual Effects – Wildlife	Page 21-11 of the EIS/A states that an accidental release of hazardous materials within and outside the Project footprint may occur and interact with wildlife through direct contact, alteration of habitat and food availability, and sensory disturbance during the subsequent spill response and restoration activities and that vegetation and terrestrial ecosystems may be affected.	ECCC recommends that prevention and mitigation measures to limit or minimize potential effects from an accidental release of hazardous materials should reference and incorporate relevant existing provincial and federal legislation, policy and guidelines, including into the proposed plans listed in Section 21.4.2.2 of the EIS/A, where relevant. ECCC also recommends that emergency response plans incorporate elements outlined in the Government of Canada's Wildlife Emergency Response Framework, available at: https://www.canada.ca/en/services/environment/wildlife-plants-species/national-wildlife-emergency-framework.html.
ECCC-117	21.4.2.3.7 Release of Hazardous Materials – Characterization of Residual Effects – Wildlife	Page 21-16 of the EIS/A states "*Many wildlife species are mobile and are expected to avoid an area affected by a spill, while other species, such as invertebrates or small rodents, may not be able to effectively avoid an affected area*." ECCC notes there are other species groups that may have limited mobility to avoid an area affected by a spill, including those with seasonal or location-specific site fidelity as well as those in less mobile life stages (e.g., breeding locations, larval/pre-fledgling individuals, etc.).	ECCC recommends that this section account for all relevant species groups that may have limited mobility to avoid an area affected by a spill when assessing Project effects and identifying mitigation measures.
ECCC-118	21.4.7.2 Effects Assessment of Accidents or Malfunctions –	With respect to the list of mitigation measures to reduce or eliminate the potential for a wildlife encounter on page 21-41 of the EIS/A, ECCC recommends the addition of a mitigation measure regarding the potential for repeated problematic wildlife encounters.	ECCC recommends that this list be updated to include the following measure:

	Wildlife Encounter – Mitigation Measures		• If repeated problematic wildlife encounters occur, non-invasive deterrence measures may be developed and implemented in consultation with the appropriate federal, provincial, and Indigenous governments.
ECCC-119	15.8.2.3.1 Amphibian Community – Existing Conditions – Modelling Methods	ECCC notes that the EIS/A only includes habitat suitability models for the spring-summer distribution of Western Toad and Columbia Spotted Frog and overwintering/hibernation habitat requirements are not included. Therefore, it is possible these activities could be occurring in higher quality habitat than what has been estimated. Furthermore, amphibians are inconspicuous during hibernation/overwintering, further increasing the risk of mortality during this period.	ECCC recommends the Proponent include an assessment of overwintering/hibernating habitat for Western Toad and Columbia Spotted Frog, including the design of mitigation measures to address seasonal sensitivities.
ECCC-120	15.8.3.2.1 Amphibian Community – Project Effects Assessment – Project Interactions Table 15.8-5	ECCC notes that several of the Project components listed in Table 15.8-5 are categorized as having no or negligible effect and are not carried forward in the assessment. Activities such as transportation, clearing and grubbing, the widening and upgrading of roads, and installation of the powerline and natural gas line, may increase both habitat loss and the risk of mortality to amphibians.	ECCC recommends the following: a) The Proponent evaluate all Project activities that may have adverse effects on amphibians, including but not limited to, transportation, clearing and grubbing, widening and upgrading of roads, and installation of the powerline and natural gas line. The rankings in Table 15.8-5 should be updated accordingly. b) Mortality risk to amphibians be carried forward, including, but not limited to, the assessment of effects due to transportation, clearing and grubbing, the widening and upgrading of roads, and installation of the powerline and natural gas line.
ECCC-121	15.8.3.2.3 Amphibian Community – Project Effects Assessment – Discussion of Potential Effects	Habitat suitability models predict very low habitat suitability for both Western Toad and Columbia Spotted Frog in the majority of the mine site footprint (Table 15.8-3 and Table 15.8-4). ECCC advises that, due to the lack of inclusion of overwintering habitat for these species, it is possible that these models underestimate habitat suitability (and thus Project interactions and effects may also be underestimated). While some of the habitat in the Project footprint was rated low for Western Toad, several adults and a toadlet were found within these boundaries, indicating that amphibians are found in this area and there is a potential risk of mortality from Project activities.	ECCC recommends that the Proponent: a) include overwintering habitat for Western Toad and Columbia Spotted Frog in their habitat suitability models; b) consider confirmed occurrences of Western toad in the Project footprint when characterizing existing conditions and habitat use for the site; and c) update modelling and the characterization of Project effects accordingly.
ECCC-122	15.8.3.4.1 Amphibian Community – Characterization of Residual Effects, Significance, Likelihood, and Confidence – Methods 15.5.3.4.1 Carnivore Community – Characterization of Residual Effects, Significance, Likelihood, and Confidence – Methods - Grizzly Bear	Page 15-520 of the EIS/A states that habitat loss and degradation was measured by calculating the loss of high-quality spring-summer habitat for Western Toad and Columbia Spotted Frog. Page 15-223 states habitat loss and degradation was measured by calculating the loss of high-quality habitat within the Project Footprint, defined as areas with high and very high habitat suitability for grizzly bear. ECCC notes it is likely that moderate-rated habitat meets the biological needs of amphibians and grizzly bear, and contributes to their survival as well; however this habitat type was not considered in estimations of habitat loss and degradation.	ECCC recommends the Proponent include moderate-rated habitat in the effects assessment for habitat loss and degradation for Western Toad, Columbia Spotted Frog and grizzly bear, and update the effects characterization accordingly.
ECCC-123	15.8.3.4.2 Amphibian Community – Characterization of Residual Effects, Significance, Likelihood, and Confidence – Potential Residual Effects Assessment 15.8.3.3 Amphibian Community – Project Effects Assessment – Mitigation Measures	The EIS/A states that pre-disturbance surveys in suitable habitat within the Project footprint will occur (page 15-522); however, this is not reflected in Table 15.8-7 (Summary of Proposed Mitigation Measures Related to Amphibian VCs). ECCC notes that other mitigation measures from Section 15.8 are also not captured in Table 15.8-7.	ECCC recommends that Table 15.8-7 be updated to include all proposed mitigation measures (i.e., pre-disturbance surveys, salvage, buffers, etc.).
ECCC-124	13.6.1.1 Thresholds for Determining Significance of	The significance thresholds identified for effects to avalanche chute ecosystems on page 13-76 of the EIS/A are higher than those used for other environmental assessments of proposed coal mines in the Elk Valley (e.g., Baldy Ridge Expansion and Line Creek Operations	ECCC recommends the Proponent consider revising thresholds for avalanche chute ecosystems to align with other projects in the Elk

	Residual Effects – Avalanche Chutes	(LCO) Phase II), as described on pages 13-75 to 13-76. For example, for LCO Phase II, a high magnitude effect was defined as the loss of avalanche chute ecosystems greater than 20%. The EIS/A concludes that the Project footprint will result in the loss of between 12% and 25% (as a reasonably conservative upper limit) of the avalanche ecosystems in the Landscapes and Ecosystems LSA and characterizes the magnitude of this effect as "moderate". ECCC notes that if the LCO Phase II thresholds were used, this effect would be considered "high". The choice of thresholds used for the characterization of effects may have implications for the determination of significance of effects to avalanche chute ecosystems.	Valley, or provide a rationale as to why the thresholds identified for the Project are higher than those of other projects.
ECCC-125	Chapter 13 Landscape and Ecosystems Assessment	The Proponent is proposing to address loss of wetland habitats through the Ecological Restoration Plan (Chapter 33, Section 33.4.1.4), which is intended to restore habitat within the Project area once mining operations are complete. ECCC notes that wetland offset measures can help to avoid loss of wetland functions and reduce impacts to SARA-listed species and migratory birds. For example, the creation of a small wetland may be beneficial to western toad and Columbia spotted frog and help to align the proposed measures with the *Best Management Practices for Amphibian and Reptile Salvages in British Columbia* (FLNRO 2016) and the *Operational Framework for the use of Conservation Allowances* (Environment Canada 2012). <u>References:</u> Ministry of Forests, Lands, and Natural Resource Operations (FLNRO). 2016. Best Management Practices for Amphibian and Reptile Salvages in British Columbia. Version 1.0., June 2, 2016. Available at: https://a100.gov.bc.ca/pub/eirs/finishDownloadDocument.do;jsessionid=002843C688DC5505CABF721F26207E36?subdocumentId=10351 Environment Canada. 2012. Operational Framework for Use of Conservation Allowances. Available at: https://publications.gc.ca/site/eng/9.696852/publication.html	ECCC recommends the Proponent consider: a) wetland offset measures to avoid temporary and long-term loss of wetland functions during construction and operations; and b) wetland offsets in the context of reducing impacts to SARA-listed species and migratory birds.
ECCC-126	13.6.6.3.3 Project Effects on Old Growth and Mature Forests – Characterization of Residual Effects Table 13.6-15 33.4.1.3 Management and Monitoring Plans – Ecological Restoration Plan	SARA-listed species, including bats and grizzly bears, and migratory birds rely on forested habitats, such old growth ecosystems, and may be negatively impacted by the loss of this habitat. The EIS/A concludes that residual effects on old growth and mature forest are significant (Table 13.6-15, page 13-155) and the Proponent is proposing to address loss of forested habitats through the Ecological Restoration Plan (Chapter 33, Section 33.4.1.3), which is intended to restore habitat within the Project area once mining operations are complete. However, as noted in Section 13.6.6.3.3 of the EIS/A, only 484 ha of forest is estimated to be restored, while a total of 917 ha of forest (of which 547 ha is old growth) is estimated to be cleared. The EIS/A also notes that these impacts are irreversible as the timescale within which it will take for old growth to re-establish is 140 years and 100 years for mature forest.	Given these conclusions, ECCC recommends that the Proponent consider: a) additional measures to reduce impacts to forested habitats, in particular old growth ecosystems, during construction and through to completion of the restoration program; b) measures to reduce the Project's residual effects on old growth ecosystems in the context of SARA-listed species (such as bat species at risk and grizzly bear) and migratory birds that rely on them; and c) the *Operational Framework for the use of Conservation Allowance* (Environment Canada 2012) in the design of mitigation and offset measures, as well as any available scientific literature, recovery strategies, and best management practices specific to any SARA-listed species or migratory birds that will be impacted by the loss of this habitat. <u>Reference:</u> Environment Canada. 2012. Operational Framework for Use of Conservation Allowances. Available at: https://publications.gc.ca/site/eng/9.696852/publication.html
ECCC-127	15.6.3.3.3 Bat Community – Projects Effects Assessment - Mitigation Measures for Increased Mortality Risk	Page 15-333 of the EIS/A states, "*pre-clearing bat roost and hibernaculum surveys will be conducted in areas considered to have high potential for roosting or hibernation*." ECCC notes that pre-clearing surveys may not be adequate to identify all features indicative of potential roosts or hibernacula.	To identify features of bat roosts and hibernacula, ECCC recommends pairing pre-clearing surveys with a suite of surveys targeting specific species and habitat types. Surveys should be conducted far enough in advance of construction activities to design and implement appropriate adaptive management measures to address impacts to any features identified.

	33.4.1.13 Management and Monitoring Plans – Wildlife Management and Monitoring Plan		Additionally, ECCC recommends that these mitigation measures be incorporated into the Wildlife Management and Monitoring Plan.
ECCC-128	15.6.2.2.1 Bat Community – Existing Conditions – Baseline Programs	The reference to the Resources Information Standards Committee (RISC) inventory methods for bats referenced on page 15-312 of the EIS/A is from 1999. ECCC notes that a more recent RISC inventory for bats has been published (RISC 2022). Reference: Resources Information Standards Committee (RISC). 2022. Inventory Methods for Bats, Standards for Components of British Columbia's Biodiversity No. 20. Version 3.0. B.C. Ministry of Land, Water and Resource Stewardship, Ecosystems Branch, Victoria, B.C.	ECCC recommends that the Proponent consult the guidelines and ensure the EIS/A, and methods therein used to establish existing conditions, is consistent with the contents of the more recent document.
ECCC-129	15.6.3.3.2 Bat Community – Project Effects Assessment – Mitigation Measures for Sensory Disturbance	Section 15.6.3.3.2 of the EIS/A does not mention lighting as a sensory disturbance to bats.	ECCC recommends that the Proponent update the EIS/A to include lighting as a sensory disturbance to bats, and provide information on potential Project-related effects of this disturbance as well as any measures proposed to mitigate any potential adverse effects.
ECCC-130	15.6.3.3.3 Bat Community – Project Effects Assessment – Mitigation Measures for Increased Mortality Risk	Section 15.6.3.3.3 of the EIS/A does not refer to guidelines for reducing spread of White-nose Syndrome (WNS). Given the recent discovery of White Nose Syndrome (WNS) in bat guano in West Kootenay, ECCC advises that decontamination protocols for WNS be adhered to. Decontamination of all clothing and gear between any site that may have bats or guano is required to avoid and reduce potential spread of WNS. Please see decontamination guidelines here: http://www.cwhc-rcsf.ca/bat_health_resources.php.	ECCC recommends the EIS/A refer to WNS decontamination guidelines in Section 15 of the EIS/A, as well as incorporate them into the education and reporting procedures described in Chapter 33, Section 33.4.1.13.6, to align with the provincial "*Best Management Practices Guidelines for Bats in British Columbia: Chapter 2 Mine Developments and Inactive Mine Habitats*".
ECCC-131	15.7.1.1 Bird Community – Regulatory and Policy Considerations Table 15.7-1	ECCC notes that Table 15.7-1 in the EIS/A includes information on federal and provincial legislation and guidance documents relevant to birds, however it does not include information about the recent update to the *Migratory Birds Convention Act* (MBCA) and its regulations in 2022. The MBCA and its regulations protect migratory birds and their eggs and prohibit disturbance, damage, destruction, or removal of migratory bird nests. Migratory birds are protected at all times; all migratory bird nests are protected when they contain a live bird or viable egg; and the nests of 18 species listed in Schedule 1 of the *Migratory Birds Regulations*, 2022 are protected year-round (including Pileated Woodpecker nesting cavities). These general prohibitions apply to all lands and waters in Canada, regardless of ownership. More information can be found here: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html https://www.canada.ca/en/environment-climate-change/services/migratory-bird-permits/faq-migratory-birds-regulations-2022.html#toc3	ECCC recommends that Table 15.7-1 of the EIS/A be updated to include information about the recent update to the *Migratory Birds Convention Act* (MBCA) and its regulations in 2022.
ECCC-132	15.7.1.1 Bird Community – Regulatory and Policy Considerations Table 15.7-1	ECCC notes that the recovery strategy listed for Lewis's Woodpecker in Table 15.7-1 on page 15-353 of the EIS/A is an outdated version. A final recovery strategy for Lewis's Woodpecker was published in 2017 (ECCC 2017). Reference: Environment and Climate Change Canada. 2017. Recovery Strategy for the Lewis's Woodpecker (Melanerpes lewis) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. vi + 40 pp.	ECCC recommends the Proponent update Table 15.7-1 with the final recovery strategy.
ECCC-133	33.4.1.13 Management and Monitoring Plans – Wildlife Management and Monitoring Plan Table 33.4-41	ECCC notes that Table 33.4-41 (starting on page 33-206 of the EIS/A) includes information on guidelines and guidance documents relevant to wildlife and wildlife habitat VCs but does not reference Canada's *Guidelines to avoid harm to migratory birds*. These guidelines are available online at: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html	ECCC recommends adding the *Guidelines to avoid harm to migratory birds* to Table 33.4-41.

ECCC-134	14.5.1.3.1 Vegetation Assessment – Existing Conditions – Whitebark Pine Habitat Availability and Distribution	Page 14-18 of the EIS/A describes reclamation methods in reference to Teck, 2008 as "*reclamation of forested sites at Fording River utilized lodgepole pine, Engelmann spruce, and subalpine fir at stocking rates of 1,000 to 1,800 stems per ha (Teck, 2008).*" ECCC notes the Teck 2008 reference is outdated regarding how restoration has been occurring in the Elk Valley. More recent practices have been undertaken in the Elk Valley and surrounding areas in recent years, including by Teck (e.g., as presented at the Whitebark Pine Ecosystem Foundation Meetings in October 2023), and as described in the following resources: Best Management Practices for Whitebark Pine (*Pinus albicaulis*). 2021. Available online: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/whitebark_pine_bmp.pdf Tomback et al. 2022. Tamm review: Current and recommended management practices for the restoration of whitebark pine (*Pinus albicaulis* Engelm.), an imperiled high-elevation Western North American forest tree. Forest Ecology and Management. Vol 522: 119929. Jenkins et al. 2022. Restoring a forest keystone species: A plan for the restoration of whitebark pine (*Pinus albicaulis* Engelm.) in the Crown of the Continent Ecosystem. Forest Ecology and Management. Vol 522: 119929.	ECCC recommends that the Proponent update the reclamation methods for Whitebark pine to align with more recent practices.
ECCC-135	14.6.5.2.1 Vegetation Assessment – Potential Effects on Whitebark Pine – Mitigation Measures for Mortality and/or Loss of Habitat 33.4.1.11 Management and Monitoring Plans – Vegetation and Ecosystems Management and Monitoring Plan Table 33.4-8 Table 14.5-10	On page 14-75 of the EIS/A, under the Ecological Restoration Plan, the Proponent states whitebark pine "*critical habitat (both types) area is to be replaced at a 1:1 ratio (i.e., area lost:area replaced), which can include improvement of existing areas of marginal condition for whitebark pine, or reclamation/restoration of disturbed areas*", as well as, "*determination of a compensation ratio for replacement of whitebark pine (i.e., the number of trees planted relative to the number removed) that considers:* • *Total number of trees removed;* • *Relative efficacy of collection/testing/propagation and revegetation methods using whitebark pine; and* • *Rates of self-thinning and background loss of whitebark pine due to white pine blister rust*". In Section 33.4.1.11 of the EIS/A, the Vegetation and Ecosystems Management and Monitoring Plan identifies that only 790 ha of restoration is planned in total for all ecosystem types including; high elevation forests, grasslands, whitebark pine dominated forests, low elevation forests, sparsely vegetated talus, riparian habitat, and wetland ecosystems. Table 33.4-8 indicates that only 148 ha of restored area will account for open whitebark pine forest, which will take up to 100 years to achieve; however, Table 14.5-10: Potential Extent of whitebark Pine Critical Habitat by Site Type shows that a total of at least 802 ha of critical habitat occur in the Project footprint. The Operational Framework for the Use of Conservation Allowances (Environment Canada 2012; hereafter the Framework) sets the parameters, based on existing legislated authorities, practice and policy, for how and when conservation allowances (offsets) should be used or recommended by ECCC. The Framework states that the choice of ratio for each offset proposal is case-specific and should be at least 2:1 and "*there will be instances where much higher ratios are appropriate*". ECCC typically recommends a minimum offset multiplier of 4:1 (offset outcome:residual impact). This is a benchmark ratio applied to a project that is in the lower end of the risk spectrum; for example, for a project with a low severity impact adversely affecting a low vulnerability ecological component. In general, the minimum 4:1 multiplier accounts for time-lags to restoration, uncertainty in outcomes, a precautionary approach, and the adverse impact itself in its specific context. Offset multipliers are variable and determined by project-specific circumstances and associated risks and uncertainties. Note that whitebark pine is listed as Endangered under SARA and therefore all offsetting actions should be consistent with the species' Recovery Strategy. <u>References:</u> Environment Canada. 2012. Operational Framework for Use of Conservation Allowances. Available at: https://publications.gc.ca/site/eng/9.696852/publication.html	ECCC recommends the EIS/A be updated to include the following for whitebark pine: a) A minimum offset multiplier of 4:1 (offset outcome:residual impact) to be consistent with the species' Recovery Strategy. b) The Vegetation and Ecosystems Management and Monitoring Plan (33.4.1.11) and the Ecological Restoration Plan (33.4.1.3) be updated with the appropriate quantity of areas to be restored considering the minimum offset multiplier of 4:1. Please refer to ECCC comments related to offsetting for species at risk habitat and wetlands (ECCC-103, ECCC-121, and ECCC-122).
ECCC-136	14.6.5.3.3 Vegetation Assessment – Potential Effects on Whitebark Pine – Characterization of Residual Effects	ECCC notes that the Proponent has determined the residual effect of the Project on mortality and/or loss of whitebark pine habitat is "*not significant*", despite characterizing the residual effects as permanent, regional, and with low resiliency (page 14-84 of the EIS/A) and the uncertainty around mitigation and restoration effectiveness (page 14-77 and 14-78 of the EIS/A). Page 14-84 also states, "*The level of confidence of the significance prediction on mortality of whitebark pine and/or loss of habitat is considered to be low, given uncertainty in the confirmed extent of whitebark pine in the Landscapes and Ecosystems LSA and Project footprint, the background loss of whitebark pine due to white pine blister rust (among other sources of mortality), and the success of whitebark pine restoration programs*."	ECCC recommends that the Proponent provide further rationale for its determination of "not significant" for residual effects of mortality and/or loss of whitebark pine, including an explanation as to how the characterization of the residual effects as permanent, regional, low resiliency, and the uncertainty around mitigation and restoration effectiveness, have been considered in its determination.

ECCC-137	Chapter 6 – Atmospheric Environment Assessment; Appendix 6C Air Quality & Greenhouse Gas Assessment	The EIS/A provides limited information on many of the greenhouse gas (GHG)-related components that are needed to be able to assess the Project's GHG impact. The information gaps and components lacking information include, but are not limited to, the following: • It is unclear which emission sources were determined to be included as a source. • While yearly emissions are included, emissions estimates are not divided by their phases. • While some direct GHG emissions are included, net GHG emission, and some of its components, are not estimated. • GHG emission intensity is not included. • GHG emissions related to accidents or malfunctions are not included. • Minimal discussion is included in the EIS/A related to the assumptions and uncertainty around the emission estimates. • The Proponent included an estimation of -286 tonnes of CO2e in Year 12 due to revegetation. However, minimal information on the Project's impact on carbon sinks is included in the EIS/A, therefore ECCC is unable to assess the potential impact of the Project on carbon sinks. • While the Proponent included some potential GHG mitigation measures, there is no documented process for the decisions behind selecting the mitigation measures. • While the Project is expected to be fully decommissioned prior to 2050, the Project's life (including post-closure) seems likely to extend past 2050. However, a plan to be net-zero is not included in the EIS/A. The Proponent may wish to refer to the following documents for helpful technical guidance: Environment and Climate Change Canada. 2020. Strategic Assessment of Climate Change. Available online: https://www.canada.ca/en/services/environment/conservation/assessments/strategic-assessments/climate-change.html Environment and Climate Change Canada. 2021. Draft Technical Guide Related to the Strategic Assessment of Climate Change. Available online: https://www.canada.ca/en/environment-climate-change/corporate/transparency/consultations/draft-technical-guide-strategic-assessment-climate-change.html	ECCC recommends the Proponent include GHG information for a more accurate and thorough assessment of the Project's GHG impact including, but not limited to, the following: a) Confirm that the GHG emission sources include all main sources. Include descriptions of the main sources and their estimated annual GHG emissions over the lifetime of the Project. The Draft Technical Guide Related to the Strategic Assessment of Climate Change (the Draft Technical Guide) may be helpful guidance, as it defines main sources as groups of equipment or activities that contribute to 1% or more of the total direct GHG emissions of the Project. b) Calculate net GHG emissions by year for each phase of the Project based on the Project's maximum capacity. c) Calculate the emissions intensity for each year of the operation phase of the Project. d) As applicable, describe potential large sources of GHG emissions that may be the consequence of accidents or malfunctions. Equation 4 in the Draft Technical Guide may be helpful guidance. e) Include methodology, data, emission factors and assumptions used to quantify each element of the GHG assessment, including any uncertainties. f) Include a quantitative and qualitative description of the Project's positive or negative impact on carbon sinks. This information may include, but is not limited to the following: i. A description of Project activities in relation to significant landscape features such as topography, hydrology and regionally dominant ecosystems; ii. Land areas directly impacted by the Project, by ecosystem type (forests, cropland, grassland, wetlands, built-up land) over the course of the Project lifetime; this includes the area of restored or reclaimed ecosystem(s); iii. Initial carbon stocks in living biomass, dead biomass and soils (by ecosystem type) on land directly impacted by the Project over the course of the Project lifetime; iv. Fate of carbon stocks on directly impacted land, by ecosystem type: immediate emissions, delayed emissions (timeframe), storage (e.g., in wood products); and v. Anticipated land cover on the impacted land areas after the Project is in place. g) Include a determination process behind the mitigation measures. The Best Available Technologies/Best Environmental Practices Determination process in the Draft Technical Guide may be helpful guidance, to assess potential mitigation measures throughout all phases of the Project and put the emphasis on minimizing net GHG emissions as early as possible and throughout the Project lifetime.

			h) Include a plan for achieving net-zero (i.e., where Equation 1 of Draft Technical Guide would equal to zero) for any Project activities beyond 2050. Equation 1 of the Draft Technical Guide may be helpful as it includes some guidance on developing a Net-Zero Plan.
ECCC-138	33.4.1.1.6 Management and Monitoring Plans – Air Quality and Greenhouse Gas Management Plan – Environmental Protection Measures	The Proponent indicates that air quality and exceedance prevention measures include the use of low emissions equipment, ensuring regular inspection and maintenance of all equipment and vehicles used in Project construction, and limiting vehicle and equipment idling.	In addition to these measures, ECCC recommends the Proponent commit to the use of Tier 4 engines. Currently, Tier 4 is the most stringent emission standard, reducing emissions of PM and NOx by 90% relative to older emission standards.
ECCC-139	33.4.1.1.8 Management and Monitoring Plans – Air Quality and Greenhouse Gas Management Plan – Greenhouse Gas Mitigation Measures	The Proponent has indicated that to reduce the potential for GHG emissions, the Project may use construction equipment that will meet Tier 2 emission standards for non-road diesel engines at a minimum. ECCC supports the use of low-emissions technology but notes that the Tier 2 emission standards limit criteria air contaminants (CACs) rather than GHGs.	ECCC recommends that the Proponent corrects the statement.
ECCC-140	Chapter 6 Atmospheric Environment Assessment Appendix 6C, Table M.1.1b	The Proponent has indicated that a CAT 6050/Komatsu PC5500 (Excavator) certified to the Tier 2 emission standard will be used for the Project. ECCC notes that Tier 4 is the most stringent emission standard at this time, reducing emissions of PM and NOx by 90% relative to older emission standards, and should be used where possible.	ECCC recommends the Proponent use an excavator certified to the Tier 4 emission standard.
ECCC-141	33.4.1.10.7 Management and Monitoring Plans – Spill Prevention, Control, and Countermeasures Plan p.33-183 Table 33.4-33, p.33-179; Table 33.4-47, p.33-230	The Proponent does not describe the full extent of the hazardous substances anticipated to be stored on site during all phases of the Project. The Proponent states in Section 33.4.1.10.7 of the EIS/A: "*An inventory of all hazardous or dangerous materials stored on-site will be maintained, and their use on-site will be monitored*", without providing further details. In addition, the Proponent identifies the 2003 version of the *Environmental Emergency Regulations* (E2 Regulations) in table 33.4-47, whereas the latest iteration is the *Environmental Emergency Regulations, 2019 (E2 Regulations)*. ECCC notes that the E2 Regulations apply to any person or company that owns or has the charge, management or control of any hazardous substances listed in Schedule 1, in quantity above or equal to the value identified in column 4, of the E2 Regulations. The E2 Regulations under the *Canadian Environmental Protection Act, 1999* are one of the instruments used by the Government of Canada to protect Canadians and the environment. They are designed to reduce the frequency and impacts of environmental emergencies involving accidental releases of hazardous substances, such as oil and chemical spills, from facilities in Canada.	ECCC recommends the Proponent update the year for the E2 Regulations in Table 33.4-47, to the latest iteration of the Regulations (i.e., *Environmental Emergency Regulations, 2019*). Additionally, ECCC recommends that the Proponent also make this update to Table 33.4-33, under federal legislation, since the E2 Regulations could apply depending on the hazardous substances and quantities stored on site.
ECCC-142	21.6 Accidents and Malfunctions Assessment – Summary and Conclusions Table 21.6-1, p.21-52	ECCC notes a discrepancy in the EIS/A's assessment of effects of accidents and malfunctions: Page 21-52 of the EIS/A states: "*In summary, the significance of environmental effects of accidents and malfunctions on all potentially affected VCs and the likelihood of occurrence is presented in Table 21.6-1 below. The effects of accidents and malfunctions on affected VCs were mostly rated significant with a high level of confidence; where significant effects were predicted, they were determined to be unlikely to occur*." However, Table 21.6-1 predominantly identifies non significant effects on various Valued Components from accidents and malfunctions. It is unclear from the information provided whether effects from accidents and malfunctions will be significant or not.	ECCC recommends that the Proponent revise the EIS/A to accurately reflect their conclusions on the significance of effects of accidents and malfunctions. The conclusions should be described consistently in the EIS/A, including on Page 21-52 and in Table 21.6-1.
ECCC-143	Chapter 6 Atmospheric Environment Assessment Appendix 6C Air Quality & Greenhouse Gas Assessment Table 30, Table 31 p. 100.	The comparison with Canadian Ambient Air Quality Standards (CAAQS) and the BC Air Quality Objectives (AQO) should be part of the determination of the nature and severity of the Project's impact on air quality. As a result, NWP has identified exceedances and frequencies of exceedances for the Project emissions alone and for Project emissions added to existing background concentrations. Exceedances occur for PM2.5, NO2 and SO2 when comparing to the BC AQO and CAAQs 2025 air quality objectives. Further, based on the most recent published air zone report for the Southern Interior Air Zone, the air zone is assigned a "red" management level for PM2.5 and SO2, "orange" management level for NO2, and "yellow" management level for ozone. The Southern Interior Air Zone did not achieve the 2020 CAAQS for PM2.5 and SO2 (Southern Interior Air Zone Report (2018_to_2020).pdf). Under the Canadian Council of Ministers of the Environment (CCME) Air Zone Management Framework, required/recommended actions become progressively more rigorous as air quality deteriorates from the green to the red management level. While this occurs at the air zone level, at a project level, an adaptive management plan should also consider thresholds or action levels that, if exceeded, would trigger additional mitigation or management actions to bring air pollutant concentrations below the thresholds for PM2.5, No2 and SO2.	The Proponent has provided a general approach to developing an Environmental Management System and monitoring plan in Chapter 33. In light of the predicted exceedances of the 2025 CAAQS for PM2.5 and NO2, ECCC recommends that the Proponent develop a trigger action response plan for air quality, similar to what was developed for Fish and Fish Habitat Management (see *Figure 33.4-4: Trigger Action Response for Fish and Fish Habitat Management)*).

ECCC-144	Chapter 6 Atmospheric Environment Assessment Appendix 6C Air Quality & Greenhouse Gas Assessment Chapter 33 Management and Monitoring Plans	Dust issues are a common public concern and road dust is a large source of fugitive emissions from mining operations. The use of a 75% control efficiency for fugitive dust in the dispersion modelling assessment requires that this be the minimum level of mitigation that can be consistently achieved throughout the year and may not be adequately conservative given the PM2.5 exceedances (Project and background) noted in comment ECCC-143. Further, the control efficiency could vary both above and below this average throughout the year. ECCC notes that in each year, there may be numerous hours during which mitigation could fall below 75% and this can coincide with warm, dry, and windy conditions that lead to more haul-road dust emissions. In addition, the Air Quality and Greenhouse Gas Management Plan should outline specific steps to minimize dust emissions from the Project. The Proponent has identified actions in the event of an air quality exceedance or air quality complaint (page 33-12 of the EIS/A), however the type and level of response should be based on thresholds or action levels that, if exceeded, would automatically trigger mitigation or management actions to bring air pollutant concentrations below the thresholds. This approach should mirror the structured approach in Figure 33.4-4 (Trigger Action Response Plan for Fish and Fish Habitat Management) but adapted for air quality purposes.	ECCC recommends the following: a) The Proponent demonstrate that the use of a 75% average control efficiency is achievable and adequately conservative for air dispersion modelling. b) The Air Quality and Greenhouse Gas Management Plan outline specific steps to minimize dust emissions, including the type and level of response to be based on thresholds or action levels that, if exceeded, automatically trigger mitigation or management actions.
ECCC-142	N/A	ECCC is developing *Coal Mining Effluent Regulations* (CMER) under the federal *Fisheries Act*, which will manage threats to fish, fish habitat, and the use of fish by humans, by setting limits on harmful substances in coal mining effluent. The CMER's proposed approach will include the establishment of national effluent quality standards for deleterious substances of concern including selenium, nitrate, and suspended solids, as well as requirements for monitoring, reporting and record keeping. The proposed Regulations are targeted for publications in the *Canada Gazette*, Part I in Fall 2024, for a 60-day consultation period, with final regulations following about a year later.	The Proponent is encouraged to consider the proposed Regulations with respect to the proposed Project.
ECCC-143	Chapter 10 Surface Water Quantity Assessment	ECCC notes methods used for the baseline hydrometric program are not always consistent with the Water Survey of Canada (WSC) Standard Operating Procedures.	ECCC recommends that the Proponent refer to the WSC Standard Operating Procedures for guidance on establishing and maintaining hydrometric stations, as well as developing rating curves.
ECCC-144	Chapter 10 Surface Water Quantity Assessment	The Water Survey of Canada (WSC) may be able to provide additional information on hydrometric stations in the Grave Creek watershed, including WSC station 08NK019 which is nearby, but has been discontinued. Clarification from WSC on any technical issues that may have occurred with this station could help the Proponent re-establish a successful station in a similar location.	ECCC recommends that the Proponent consult WSC for information on establishing a hydrometric station at Grave Creek above Harmer Creek.