



APPLICATION FOR AN AMENDMENT TO ENVIRONMENTAL CERTIFICATE #M09-01(MT. MILLIGAN COPPER-GOLD PROJECT)

AMENDMENT #7

Thompson Creek Metals Company A Subsidiary of Centerra Gold

July 2019



EXECUTIVE SUMMARY

Thompson Creek Metals Company Inc. (TCMC) is applying for Amendment 7 to the Environmental Assessment Certificate (EAC #M09-01) Certified Project Description (CPD) for the Mt. Milligan Copper-Gold Mine Project (the Project), located approximately 155 kilometres (km) northwest of Prince George, British Columbia (BC). The proposed changes for this Amendment Application include the construction, installation and operation of a 4.8 kilometre (km) long, 25 kilovolts (kV) (Phase-Phase) powerline along an existing road. The powerline will replace the use of diesel generators that currently provide the power to withdraw and convey water from Philip Lake 1 and Rainbow Creek. The proposed updated Right-Of-Way (ROW) covers 7.49 hectares (ha) in total and includes 79 poles. The majority of the ROW is along existing disturbance, primarily the existing 230 kV powerline corridor, cut block(s), and forest service roads (fsr). New ground disturbance area is approximately 0.50 ha.

All Valued Components (VCs) identified in the original Environmental Assessment Certificate (EAC) Application were considered in the effects assessment. Three VCs (Vegetation and Plant Communities, Wildlife and Wildlife Habitat, and Archaeology and Heritage Resources) were carried through in the assessment, while the others were not due to no effects, or negligible effects, being identified from the known effects of the construction, operation, and decommissioning and reclamation of the original 230 kV powerline.

In consideration of the interactions between the construction, operation and decommissioning of the powerline infrastructure that follows existing disturbance corridors and the proposed mitigation measures, the potential incremental adverse environmental effects for each of the three VCs are predicted to be negligible to low in magnitude, local, long-term in duration (i.e., for the life of the infrastructure), negative, with low environmental consequence, and not significant. No cumulative effects are predicted.

Consistent with the EAO's findings regarding the effects of the Project on the Aboriginal Interests in previous amendment applications, the risk of adverse effects on resources needed to exercise Aboriginal interests has been mitigated or avoided due to the relatively small footprint of the proposed Project changes, the mitigation measures that will be implemented and the requirements for reclamation.

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With submission of this application, TCMC is seeking an amendment to EAC #M09-01 to allow construction, operation through November 2021, and decommissioning of the proposed 25 kV powerline with mine closure. TCMC is proposing that the Certified Project Description in Amendment #3 is amended to remove the following bullets under Section 3 "Project Components":

- A diesel generator housed, enclosed or otherwise situated to produce a maximum noise level of 68dBA.
- Secondary containment for the generator, fuel tanks and refueling areas.

and that the Certified Project Description (CPD) in Amendment #6 is amended to add the following bullet under Section 3 "Project Components":

- A powerline within the powerline corridor as identified in Figure x.
- Two sub stations in the locations as identified in Figure x

TCMC also proposes to amend the wording in the CPD in Amendment #6 to state:

"b. Groundwater wells, pipeline, and utilities (up to 15 hectares of disturbance) within the 6 kilometre buffer of the mine lease (Shown on Figure 1). Groundwater will be pumped for use in mine operations."



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1 INTRODUCTION

On March 16, 2009, Thompson Creek Metals Company Inc. (TCMC) received an Environmental Assessment Certificate (EAC #M09-01) to build and operate the Mt. Milligan Copper-Gold Mine Project (the Project) approximately 155 kilometres (km) northwest of Prince George, British Columbia (BC; Figure 1-1). The mine is an open pit copper-gold operation with a processing plant (mill), a tailings storage facility (TSF), and various ancillary facilities. Mining operations started in September 2013 with an approved operation of approximately 15 years.

Process water used to operate the mine initially included three main sources: mine site surface runoff that flows into the TSF; water collected from Meadows Creek; and recycled TSF water. Stored water volumes in the TSF were found to be diminishing through late 2016 and throughout 2017. Consequently, TCMC was forced to shut down the mill in December of 2017. Three amendments (#3, #4, and #6) have been made to EAC #M09-01 to address water shortages for short and intermediate terms, and one (#5) addressing Meadows Creek fish passage. These are identified in Table 1.1, which describes the relevant amendments prior to this Amendment Application.

Table 1-1 Summary of Amendments to Date Relevant to the Water Shortage Issue

Amendment	Description of Relevant Amendments (Changes from Certified Project Description)
Amendment #3	Due to identified water shortage for mill processing, TCMC applied for EAC Amendment #3, and a Water Sustainability Act short-term use approval, to allow water withdrawals from Philip Lake 1. This was to supplement water supply for the mill. The certificate amendment was issued in January 2018; condition 6 of the certificate allowed water withdrawals from Philip Lake 1 until October 31, 2018 and limited the permissible withdrawals from Meadows Creek (under conditional water licence C125689) to the 2018 spring freshet (Stantec 2018).
Amendment #4	The mine continued to experience water shortage, requiring additional water supplies. Therefore, TCMC applied for Amendment #4 to address the water supply issue. The amendment included a plan to access immediate-term supply sources and to develop a plan to access medium-term supply sources for the subsequent three years. This plan was intended to be in place until long-term supply sources could be identified that would meet the mine's operational requirements for the life-of-mine. TCMC anticipated that three years was required for consultation and to conduct necessary analysis and data collection to inform the development of long-term water supply sources. In August 2018, TCMC received approvals for immediate term supply sources, including surface water withdrawals from Philip Lake 1 until November 15, 2018, and groundwater withdrawals from wells within the TSF and one existing groundwater well outside of the TSF during mine operations (Stantec 2018).



Table 1-2 (continued) Summary of Amendments to Date Relevant to the Water Shortage Issue

Amendment #6	As part of the medium-term supply plan for mine operation, TCMC sought and received EAC Amendment #6 to allow use of the following water supplies: surface water withdrawals from Philip Lake 1, Meadows Creek, and Rainbow Creek for three years; and groundwater withdrawals from
	wells developed within 6 km of the mine lease boundary for life-of-mine.

Note:

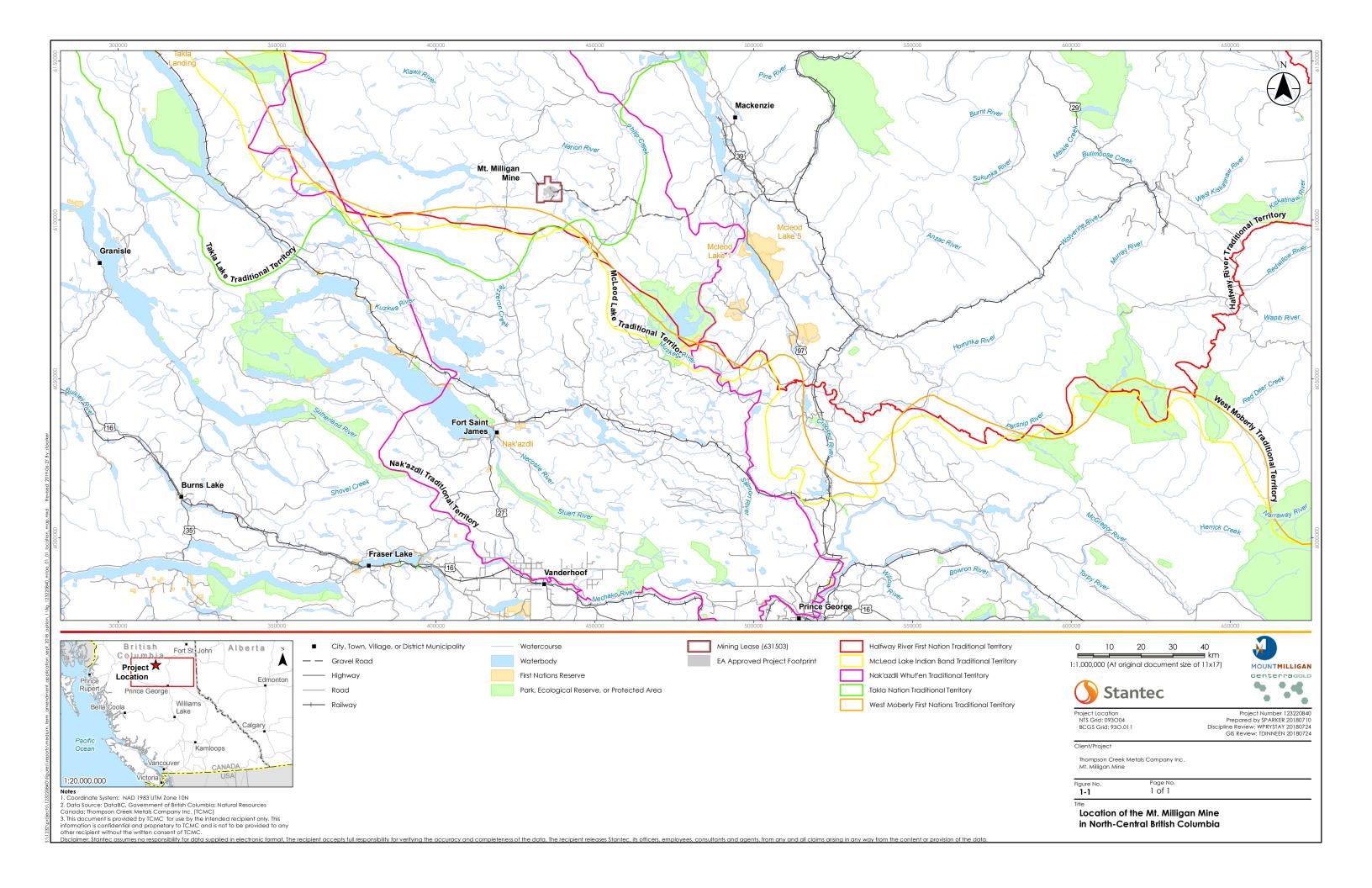
Amendment #1 was to relocate the ore concentrate rail load-out facility for the Project and construction and operation of a new camp; Amendment #2 was to change the holder of the certificate to TCMC; and Amendment #5 was to add fish passage infrastructure on Meadows Creek to the Certified Project Description (CPD).

Currently, permitted freshwater use is needed to maintain mill operation and is sourced from surface water withdrawals from Philip Lake 1, Meadows Creek, and Rainbow Creek and groundwater well withdrawals.

Fresh water to supplement the TSF water storage is currently obtained from Philip Lake 1 and Rainbow Creek via pipelines and pumping stations and is authorized until November 2021 (TCMC 2019a). The Meadows Creek Water Supply Pond (MCWSP) was initially identified as an off-site water storage facility for Mount Milligan. On review of the ability of the creek to supply the mine's water requirements, it was determined that the drainage simply could not supply the 1.8M m³ of water per year that it was projected to. TCMC determined that the environmental impacts of building the 44 ha MCWSP was not justifiable. The company is seeking to eventually amend the EA Certificate to remove the facility from the mine design. Removal of this facility will also reduce potential sediment and erosion hazards.

The current medium-term supply sources require use and on-site storage of diesel fuel in order to operate the diesel-powered generators and pumps at Philip Lake 1 and Rainbow Creek. Diesel fuel is trucked from surrounding communities to site. It is estimated that approximately 900,000 L of diesel fuel will be used in 2019 to provide electricity to convey water from Philip Lake 1 and Rainbow Creek to the TSF.

A solution to reduce the reliance on diesel fuel to produce electricity has been developed and is proposed and described in Section 2 of this Amendment Application.



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2 PROPOSED CHANGES TO SCHEDULE A (CPD, EAC #M09-01)

The proposed changes to the EAC (#M09-01) Certified Project Description (CPD) are described below and illustrated in Figure 2-1. The proposed changes for this Amendment Application include the construction, installation and operation of a 25 kilovolt (kV) (Phase-Phase) powerline along existing roads as well as the option to convey groundwater to currently approved and permitted infrastructure (e.g. the TSF, Pond 1 and Pond 2) other than those currently listed in the CPD (Water Storage Tanks and the South Pond).

The powerline will replace the use of diesel generators that currently provide the power to withdraw and convey water from Philip Lake 1 and Rainbow Creek to the TSF. The proposed powerline is approximately 4.8 km in length and the Right-of-Way (ROW) is on average approximately 20 m wide, with widths ranging from 10 to 30 m. The proposed updated ROW covers 7.5 hectares (ha) in total. The majority of the ROW is along existing disturbance, the existing 230 kV powerline, cut block, and FSRs. New ground disturbance area is approximately 0.50 ha.

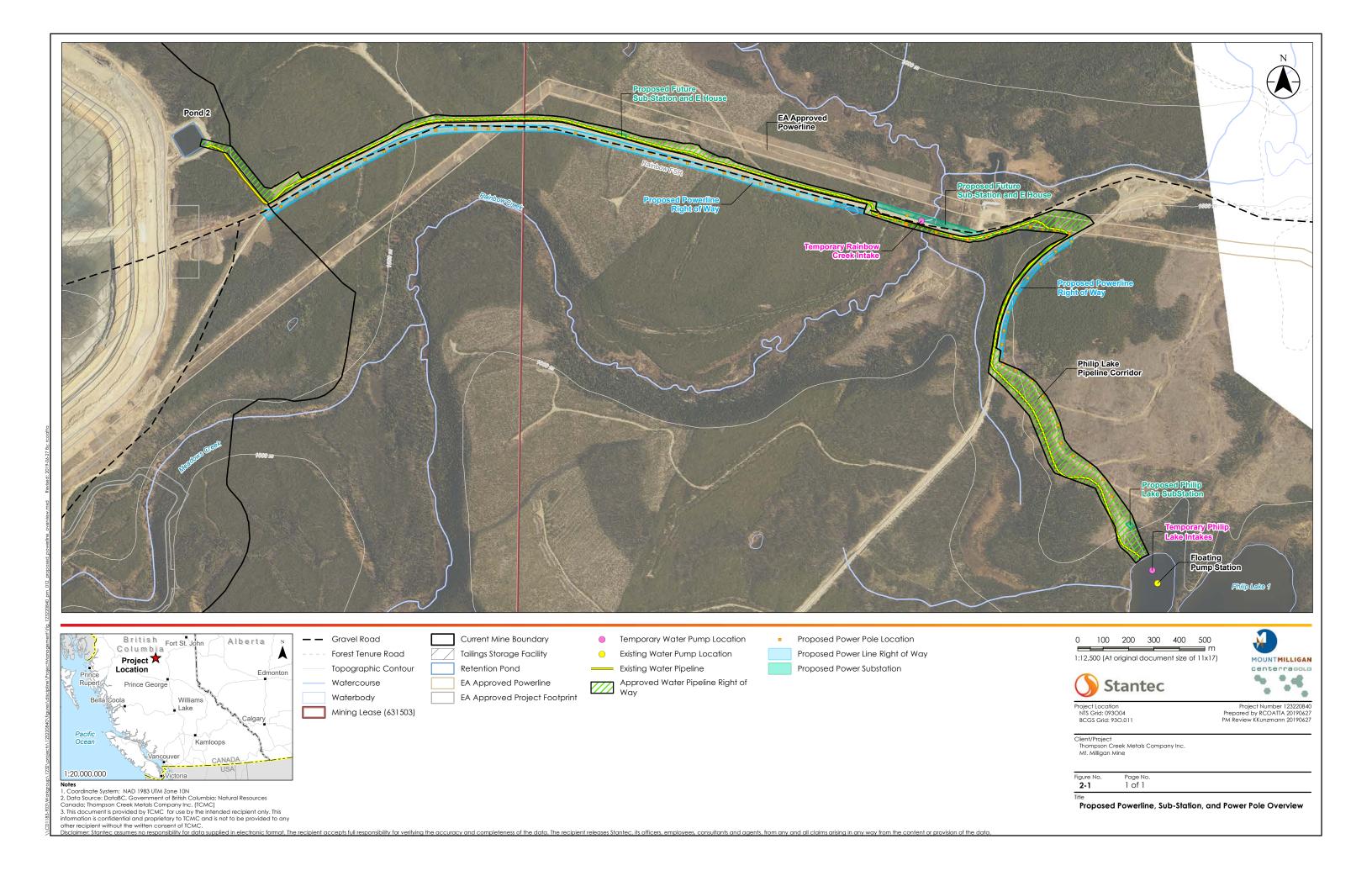
The proposed 25 kV powerline includes the following key changes to existing present-case disturbance:

- The ROW on the North side of Rainbow FSR will be extended to include an anticipated pumping station at Rainbow Creek;
- Taller poles and structures are to be used in order to cross waterways (75-foot (ft) poles & 1 phase/pole vs. 3 phases/pole); and
- A new distribution line will be buried underneath the current 230 kV powerline.

As groundwater was determined to be a preferred option for external water sources for the Mt. Milligan Mine, groundwater exploration continues to be conducted in additional areas. To minimize pipeline and utilities disturbance within the 6 kilometre buffer of the mine lease, TCMC proposes to amend the wording in the CPD in Amendment #6 to state:

"b. Groundwater wells, pipeline, and utilities (up to 15 hectares of disturbance) within the 6 kilometre buffer of the mine lease (Shown on Figure 1). Groundwater will be pumped for use in mine operations."

This change in wording does not change any of the results of the previous assessment, it only provides TCMC with the flexibility to reduce pipeline distance to currently approved and permitted infrastructure to convey water to the ultimate destination (the TSF). As such this requested change will not be assessed further in this application.



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3 POST-CERTIFICATE REGULATORY APPROVAL PROCESSES

TCMC has developed management plans to ensure its existing operations meet or exceed the Governments of Canada and BC laws, regulations, and policies that contribute to the protection of the environment. These management plans apply to the proposed works of this Application. The key applicable legislation and management tools that affect this environmental assessment are identified below (Stantec 2018).

3.1 Legislation

The federal and provincial environmental legislation applicable to this Amendment are provided in Table 3-1.

Table 3-1 Legislation Applicable to this Amendment Application

Legislation	Applicable Section	
Fisheries Act (1985)	Section 36 prohibits the pollution of fish-bearing waters	
	Section 35 prohibits the killing of fish and the permanent alteration, disruption or destruction of fish habitat unless authorized by the Minister	
Wildlife Act (1996)	Section 9 prohibits the destruction of beaver dams and muskrat density without a permit	
	Section 34 prohibits the disturbance or destruction of birds, eggs, the nests of specific birds year-round, and active bird nests during breeding season	
Migratory Birds Convention Act (1994), Migratory Birds Regulation (C.R.C., c. 1035)	Section 6 prohibits the disturbance or destruction of a migratory bird's nest	
Heritage Conservation Act	Section 13 protects heritage sites and objects that predate AD 1846 unless approved	
	Section 12 allows for the issuance of a permit to allow for the recovery of a heritage site	
	Section 14 allows for the issuance of a permit	

3.2 Management Tools

The Construction Environmental Management Plan (CEMP; 2019) developed for the construction of the proposed 25 kV powerline is a component of the Project's Environmental, Health and Safety Management System (EHSMS) that has been in place since the start of mine development. The CEMP will manage environment and regulatory compliance throughout the duration of construction work for the powerline to protect VCs.

The CEMP works in concert with other management plans within the EHSMS, including the following key applicable documents (TCMC 2019b):

- Emergency Preparedness Plan (EPP): this plan describes processes and procedures in place for emergency response at the Project and is supported by the Mine Emergency Response Plan (ERP).
- Occupational Health and Safety Plan (OH&SP): this plan supports the Project's commitment



to a safe environment for employees, construction contractors and visitors. The plan outlines the overall strategy and standards for safety during the construction phase of the Project.

- Water, Seepage and Erosion Control Management Plan (WSECP): this plan provides the
 process and procedures in place for water management and erosion controls for construction
 and operation activities and includes descriptions of best management practices and where
 they are most appropriate.
- Cultural Heritage Management Plan: this plan manages and protects archaeological and cultural heritage resources during construction and operations, by providing the framework to identify, manage, protect, or mitigate recorded and previously unrecorded archaeological and cultural heritage resources encountered during project construction.
- Spill Contingency Plan: this plan outlines preventative protection measures to avoid accidents and malfunctions, primarily from spill or accidental releases of chemicals or petroleum products onto land or into water; it outlines spill response procedures as well.

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4 PROJECT ENVIRONMENTAL SETTING OVERVIEW

The combined 80 mineral claims within the Mt. Milligan property consists of 49,744 hectares (ha), occurring on Crown land in the Omineca Mining Division (Stantec 2018). These mineral claims in the property are all owned by TCMC, are registered under Mine Lease 631503, and covered by a no staking reserve for placer minerals.

The mine site is located within the Rainbow Creek watershed. This watershed encompasses an area of 232 square kilometres (km²), ranging in elevation from approximately 1,100 metres (m) above sea level (masl) at its headwater south of the mine site to about 850 masl at its confluence with the Nation River (Stantec 2018). Rainbow Creek has several major tributaries, including Meadows and Limestone Creeks. The confluence of Meadows Creek with Rainbow Creek is approximately 28 km upstream from the Rainbow Creek-Nation River confluence. Meadows Creek drains an area of about 12 km². The watershed to the east is Philip Creek watershed and to the west is Suschona Creek watershed. The Philip Creek watershed has an area of 764 km² and is located immediately to the east of the Rainbow Creek watershed. Philip Lake 1, which is permitted for use as a water supply until November 30, 2021, is in the upper portion of the Philip Creek watershed and has a contributing sub-watershed area of 56 km². The Suschona Creek watershed is located west of the Rainbow Creek watershed and drains an area of approximately 165 km².

The mine site is located within the traditional territories of the following Indigenous groups:

- Nak'azdli Whut'en;
- McLeod Lake Indian Band;
- Takla Nation (formerly known as Takla Lake First Nation);
- West Moberly First Nation; and
- Halfway River First Nation.

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5 PROJECT EFFECTS ASSESSMENT

TCMC has based its assessment of potential effects of the proposed changes to the EAC #M09-01 CPD on the assessment methods detailed in Volume (Vol.) 5, Section 5 of the EAC Application, and in Amendment 6 (Stantec 2018).

The same VCs assessed in the EAC Application (Vol. 5, Section 5) were considered for this Amendment Application. Potential interactions between each VC and the proposed amendment project changes were considered. VCs not assessed in this Amendment Application, and corresponding rationale for their exclusion, are provided in Table 5-1.

The relevant VCs for assessment in this Amendment Application include:

- Vegetation and plant communities
- Wildlife and Wildlife Habitat
- Archaeology and heritage resources

Table 5-2 provides a summary of the changes and/or additions to mitigation measures presented in the EAC Application, as a result of the Amendment Application assessment. Also included in the table are changes to the EAC Application's characterization of residual effects and significance determinations. Detailed assessments of the VCs addressed in this Amendment Application are provided in the following sections.



Table 5-1 Valued Components from TCMC (2008) EAC Application Excluded from Assessment in this Amendment Application and Rationale

Valued Component	EAC Application Section	Proposed Change Project Interaction Identified	Rationale for VC Exclusion from this Amendment Application Assessment
Terrain, Soils and Geology	5.2	Construction of Power Line (New disturbances) may interact with soils	Negligible effects to Terrain, Soils, and Geology is identified. Assessment of effects to soils are considered, as appropriate, in the vegetation and plant communities assessment.
Climate and Air Quality	5.3	No/negligible interaction	No interaction is identified between the proposed Amendment Project activities and the climate and air quality VC.
Noise	5.4	No/negligible interaction	No interaction is identified between the proposed Amendment Project activities and the noise VC.
Water Resources	5.5	No/negligible interaction	Taller (75 foot) power poles will be used to cross any waterways; therefore, there is no interaction identified between the proposed Amendment activities and the Water Resources VC.
Fisheries and Aquatic resources	5.6	No/negligible interaction	Taller (75 foot) power poles will be used to cross any waterways; therefore, there is no interaction identified between the proposed Amendment activities and the Fisheries and Aquatic Resources VC.
Social and Economic Resources	5.10	No/negligible interaction	Expenditures and workforces required to construct and operate the powerline are very small in comparison to the overall Project expenditures and workforce requirements assessed in the original EAC application (Terrane Metals Corp. 2008 <i>in</i> Stantec 2018). The proposed Project changes are anticipated to have a negligible interaction with social and economic conditions
Non-traditional Land Use	5.11	No/negligible interaction	Overall, based on the assessment of non-traditional land use in Section 5.11 of the original EAC Application (Terrane Metals Corp. 2008 <i>in</i> Stantec 2018), interactions with the proposed Project changes are anticipated to be negligible. The changes proposed in this Amendment Application are negligible changes from that of the EAC Application, thus overall considered negligible.



Table 5-2 (continued) Valued Components from TCMC (2008) EAC Application Excluded from Assessment in this Amendment Application and Rationale

Visual and Aesthetic Resources	5.12	No/negligible interaction	The powerline will mainly be located within the Project's existing licence to cut (L50834) and mining lease (631503) and associated with existing linear features. The clearing of land will have negligible interactions on visual and aesthetic resources due to the limited use of the area and its adjacency to and alignment with existing disturbances (Stantec 2018). As stated in the Amendment 6 Application, the nearest tourism use area, park, or forest recreation site is located approximately ≥10 km east of the Mt. Milligan Mine (Stantec 2018). Based on the assessment of visual and aesthetic resources (Section 5.12) of the original EAC application (Terrane Metals Corp. 2008), interactions with the proposed Project changes are anticipated to be negligible.	
Navigable Waters	5.15	No/negligible interaction	The construction and operation of the powerline will have no or negligible interaction with navigation of waterways.	
Environmental Health	5.13	No/negligible interaction	The proposed Project changes are not expected to result in solid, liquid, or atmospheric emissions and therefore interactions with environmental health are predicted to be negligible negative effects, and would likely result in positive effects with the reduction of diesel use and reduced trucking loads.	
Human Health	5.14	No/negligible interaction	The proposed Project changes are not expected to result in solid, liquid, or atmospheric emissions and therefore interactions with environmental health are predicted to be negligible negative effects, and would likely result in positive effects with the reduction of diesel use and trucking loads.	



Table 5-3 Summary of Changes to Mitigation Measures, Characterization of Residual Effects, and Determinations of Significance of VCs assessed in this Amendment Application

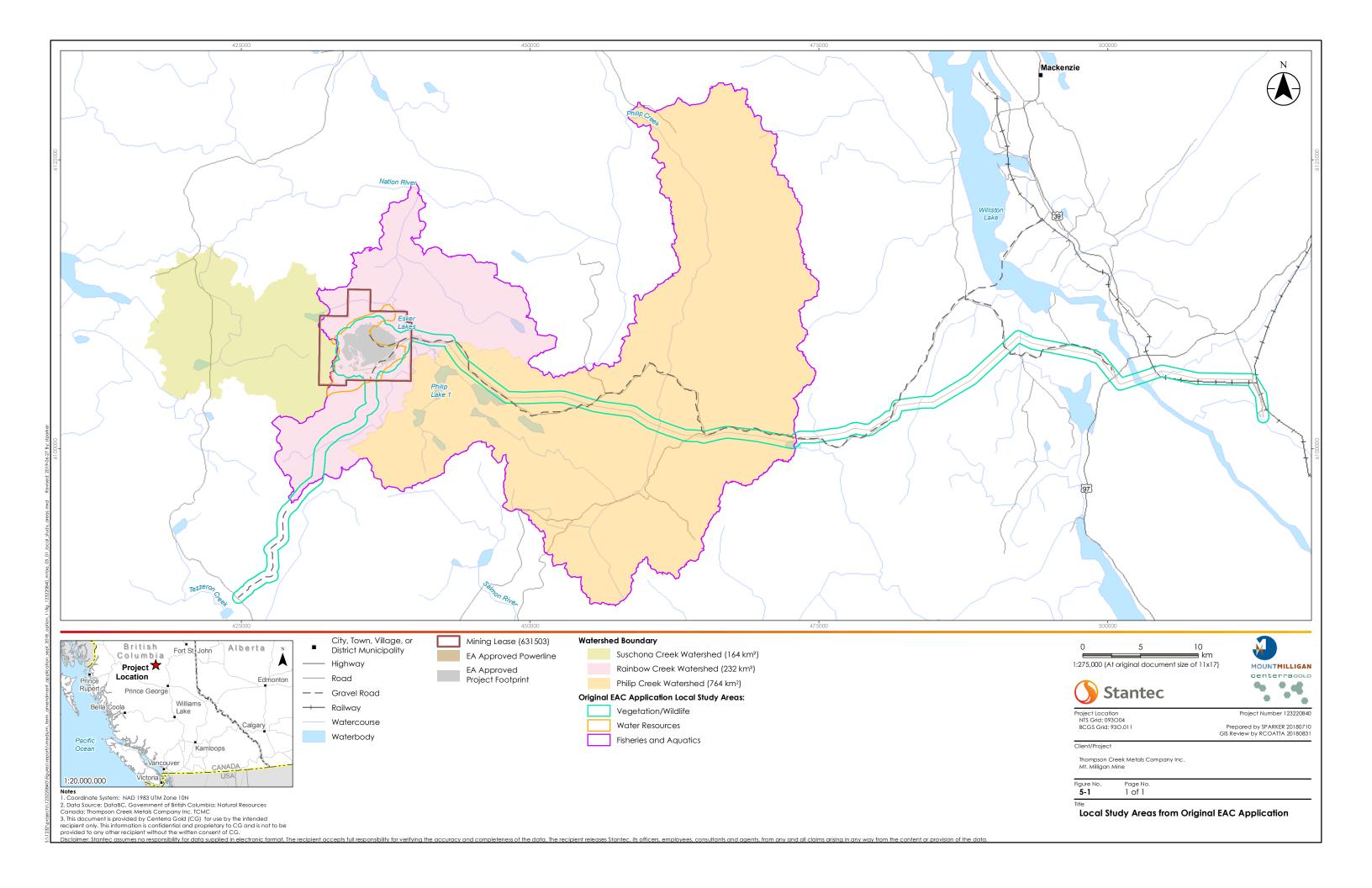
Valued Component	EAC Application Section	Potential Project Interaction	Change to EAC Application Mitigation Measures	Change to EAC Application Characterization of Residual	Change to EAC Application Significance
Vegetation and Plant Communities	5.7	Construction of the powerline will involve removal of vegetation, potentially affecting Vegetation and Plant Communities	None	Effects None	No change
Wildlife and Wildlife Habitat	5.8	Construction of the powerline have the potential to affect Wildlife and Wildlife Habitat	None	None	No change
Archaeology and Heritage Resources	5.9	Surficial ground disturbance and vegetation clearing for installation of the powerline may interact with archaeological and heritage resources.	None	None	No change

5.1 Project Effects Methodology

This section of the Amendment Application identifies the VC's that have or do not have potential interaction with the proposed amended Project changes. For those that are identified as no interaction or negligible effects, rationale is provided as to their exclusion in the effects assessment. For those VCs that are identified as having potential Project effects, the effects assessments are included with the following information (Stantec 2018):

- Identified Mechanism: a description of how the proposed Project changes could affect the VC and lead to adverse effects
- Mitigation: identification of mitigation measures to reduce or eliminate potential adverse effects of the proposed Project changes
- Characterization of residual effects: a description of if and how the proposed Project changes alter the characterization of residual effects set out in the original EAC application in terms of the applicable metrics presented in Section 5.1.3.5 of the original EAC application (e.g., magnitude, spatial extent, duration).
- Significance Rating: a determination of whether the proposed Project changes result in changes to the significance determinations for the Project, as presented in the EAO (2009) Assessment Report and amendment assessment reports (2013b, 2017, 2018a).

Figure 5.1 shows the local study areas (LSAs) from the original EAC application (Stantec 2018), and that remain applicable to this Amendment Application.



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5.2 Vegetation and Plant Communities Effects Assessment

The assessment of the Project's interactions with the Vegetation and Plant Communities VC considers the construction, operation and decommissioning of the 25 kV powerline. The following sections describe the baseline conditions, potential effects, mitigation measures, and residual effects for the proposed powerline construction.

5.2.1 Baseline Conditions

The area encompassed by the 6-km buffer on the mine lease area overlaps two biogeoclimatic units, the Engelmann Spruce-Subalpine-fir Omineca Moist Very Cold variant (ESSFmv3) and the Sub-Boreal Spruce Mossvale Moist Cool variant (SBSmk1; Stantec 2018). The proposed Project changes may affect Vegetation and Plant Communities in the SBSmk1. Climax forests in the SBSmk1 are dominated by hybrid white spruce; subalpine fir is generally absent, and natural disturbances often result in areas dominated by lodgepole pine and trembling aspen, with Douglas-fir occurring on drier warm aspects (BECWeb 2019; Stantec 2018). Black spruce occurs in wetlands and in combination with lodgepole pine on poorer upland sites. Paper birch occurs sporadically often in combination with Douglas-fir, and black cottonwood occurs along streams and rivers (BECWeb 2019; Stantec 2018). Common understory species on mesic (average moisture) sites are black huckleberry, black twinberry, and oak fern; on drier sites, soopolallie and dwarf blueberry are most common (BECWeb 2019; Stantec 2018). Ecosystems found in the mine area (local study area [LSA], Figure 5.1 are provided in Section 4.7 of the original EAC application (Terrane Metals Corp. 2008).

Around the proposed Project changes, outside of the mine development, forestry (cutblocks) and access roads are the primary human disturbances. Young forest, wetlands and riparian areas are common in the LSA (Stantec 2018). Ecosystems of conservation concern are known to occur in the mine area, and plant species of conservation concern may occur in the mine area (Terrane Metals Corp. 2008; Stantec 2017b *in* Stantec 2018).

The proposed Project changes do not overlap any identified protected or designated areas (e.g., parks, Old Growth Management Areas). There are no plant species on Schedule 1 of the federal Species at Risk Act known or likely to occur in the mine area (BC CDC 2018 *in* Stantec 2018).

5.2.2 Effects Assessment

The proposed Project changes have the potential to interact with Vegetation and Plant Communities through vegetation clearing and ground disturbance for the Power Line infrastructure.

Potential effects on vegetation and plant communities are similar to those identified in Amendment 6 (Stantec 2018):

- Loss of plants used traditionally by Indigenous groups
- Loss of plant habitat or alteration of plant community structure and composition

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- Loss of rare plant species
- Loss or alteration of plant communities at risk

The powerline infrastructure will follow existing cleared, linear corridors within the approved footprint to the extent possible; however, additional vegetation clearing is required in some areas for widening the ROW. The total clearing area is approximately 0.50 ha.

No rare plant species were identified during rare plant surveys conducted for the original EAC application although the potential for rare plants is possible (Terrane Metals Corp. 2008). TCMC has a commitment to salvage and relocate incidental rare plants identified during construction activities, per the Landscape, Soils and Vegetation Management Plan (TCMC 2016a *in* Stantec 2018).

Potential effects to the Vegetation and Plant Communities, specifically the loss of plants traditionally used by Indigenous groups; loss of plant habitat or alteration of plant community structure and composition; loss of rare plant species; loss or alteration of plant communities at risk; and vegetation and plant communities overall; the residual effects are predicted to be low to negligible. This characterization assumes that where appropriate and as necessary, mitigation measures described in the Table of Proponent Commitments of EAC #M09-01, in TCMC's existing Landscape, Soils and Vegetation Management Plan (TCMC 2016a *in* Stantec), and in Section 3.2 will be adhered to.

5.2.3 Significance

Based on the assessment of potential effects on the Vegetation and Plant Communities VC and the implementation of the mitigation measures, the residual effects on the Vegetation and Plant Communities VC are not likely to be significant. The characterization of these residual effects is unchanged from the assessment provided in Section 5.7 of the original EAC application.

5.3 Wildlife and Wildlife Habitat Effects Assessment

The assessment of project interactions with Wildlife and Wildlife Habitat considers the construction, operation and decommissioning of the 25kV powerline. The following sections describe the baseline conditions, potential effects, mitigation measures, and residual effects for the proposed powerline construction.

5.3.1 Baseline Conditions

The area encompassed by the 6-km buffer on the mine lease area overlaps two biogeoclimatic units, the ESSFmv3 and the SBSmk1. However, the proposed powerline is confined to the SBSmk1, which is described in the baseline conditions of the Vegetation and Plant Communities VC (Section 5.2.1). As noted, coniferous forests are dominant but mixed-wood areas may occur, and berry-producing plants are found in the forest understory (Stantec 2018). Cutblocks and roads are the primary human disturbances, in addition to the Mt. Milligan mine operation, and wetlands and riparian areas are common. The range of ecosystem types and seral stages in the LSA support a wide variety of wildlife species, including grizzly bear, moose,

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fisher, and northern goshawk (Stantec 2018). Terrane Metals Corp. (2008) reported confirmed occurrences of 22 mammal species, 118 bird species, 4 amphibian species, 1 reptile species, and 59 insect species (Stantec 2018). Wildlife species of conservation concern are known to occur, including species on Schedule 1 of the Species at Risk Act (e.g., barn swallow, bank swallow, common nighthawk, olive-sided flycatcher, rusty blackbird, and western toad; Terrane Metals Corp. 2008; BC CDC 2018 *in* Stantec 2018). As stated in Stantec (2018), the presence of caribou around the Mt. Milligan Mine site is very unlikely because caribou are considered extirpated in this area (Environment Canada 2014). The proposed powerline does not overlap any designated areas for wildlife (i.e., Wildlife Habitat Areas, Ungulate Winter Range, critical habitat).

5.3.2 Effects Assessment

The proposed Project changes have the potential to interact with the Wildlife and Wildlife Habitat VC during the construction phase through vegetation clearing and ground disturbance for the ROW. Potential effects on Wildlife and Wildlife Habitat are (Stantec 2018):

- Change in habitat availability through:
 - loss or conversion from clearing of vegetation in the extension areas of the ROW or through avoidance, or
 - under-utilization because of sensory disturbance during construction and operation;
- Change in mortality risk through clearing of vegetation or ground disturbance activities during the breeding season for birds and amphibians, and possible electrocution for raptors from the powerline, and
- Change in movement through displacement during construction and operation and diversion around or avoidance of above-ground infrastructure.

Change in habitat availability is predicted to be negligible. The ROW follows existing linear disturbance (Section 2), although vegetation clearing will be required in new disturbance areas. The proposed 25 kV powerline for this Amendment Application is 5% the length of the original 230 kV powerline length (constructed and in operation), and the majority follows existing disturbance. As described for the Vegetation and Plant Communities, the new clearing required is estimated to be 0.50 ha. Some of this clearing will be in treed conifer forest and could result in decreased habitat availability for forest songbirds, raptors, and furbearers (Stantec 2018). Some species (e.g., grizzly bear) may temporarily avoid areas during construction; avoidance of habitat due to the presence of project works will be less likely during operation when sensory disturbance will be diminished to current conditions.

TCMC's existing Wildlife Management Plan outlines restricted work periods and recommended buffer zones for bird nests potentially occurring within the LSA that is applicable to the proposed clearing activities (TCMC 2018). Vegetation clearing will adhere to restricted work periods outlined in the Wildlife Management Plan to the extent possible. If vegetation clearing or ground disturbance activities within previously cleared or disturbed areas are scheduled to occur within the restricted work period, pre-clearing nest surveys will be completed by qualified personnel to assess the risk of incidental take. If vegetation clearing or ground disturbance activities have the potential to affect a waterbody, such as an ephemeral

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pool, that supports breeding or dispersing western toad, then setbacks, timing restrictions, salvage, or monitoring will be implemented to avoid or reduce mortality risk as per industry best practices (i.e., FLNRO 2014 *in* Stantec 2018).

In implementing the Wildlife Management Plan, including all mitigations and ensuring clearing of vegetation occurs outside of the bird and amphibian breeding windows, the potential for increased mortality risk will be negligible.

An increase in linear access for hunters and predators can increase mortality risk for bears, ungulates, and furbearers; however, the nature of access created by the widening of existing ROW is not expected to contribute to improved hunter or predator access as the powerline follows existing routes.

Effects on wildlife movement are predicted to be low during construction due to the vegetation removal and installation of poles and powerlines, and, similarly during decommissioning. Effects on wildlife movement during operation is predicted to be negligible. Above-ground infrastructure (powerline infrastructure) is not expected to affect wildlife movement in a substantive way because it follows existing linear infrastructure and only negligible sources of surface impediments (e.g., poles) will occur.

With mitigation measures described in the Table of Proponent Commitments of EAC #M09-01, in TCMC's existing Wildlife Management Plan (TCMC 2018), and in Section 3.2 being implemented, residual effects to Wildlife and Wildlife Habitat are predicted to be low to negligible. The effects include change in habitat availability, change in mortality risk, and change in movement.

5.3.3 Significance

Based on the assessment of potential effects on the Wildlife and Wildlife Habitat VC and the implementation of mitigation measures, the residual effects are not likely to be significant to Wildlife and Wildlife Habitat. The characterization of these residual effects is unchanged from the assessment provided in Section 5.8 of the original EAC application.

5.4 Archeology and Heritage Resources Effects Assessment

5.4.1 Baseline Conditions

The assessment of project interactions with Archeology and Heritage Resources considers the construction, operation and decommissioning of the 25kV powerline. Section 4.9 of the original EAC application considered potential Project effects on archaeology and heritage resources based on completed baseline studies, including archaeological overview assessments (AOA) and archaeological impact assessments (AIA), and undertaken to identify and inventory archaeological and heritage resource sites within the 2008 proposed Project footprint (EAO 2009; Stantec 2018). The changes in this amendment include ground disturbance outside of, although adjacent to, areas addressed by the 2009 AOA baseline studies. As a result, the assessment of the changes in Amendment 6 Application and this Amendment and

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their interactions with archaeology and heritage resources, are not consistent with the scope of the original EAC Application. The revised development footprint in Amendment 6 is within areas subsequently subject to desktop archaeological assessment (Ecofor 2007b, 2010, 2017, 2018), and these areas overlap the proposed changes in this Amendment. No previously recorded archaeological sites or other Heritage Conservation Act-protected heritage resources are within the proposed powerline ROW; However, not all of these areas have been subject to in-field archaeological assessment. Therefore, these areas have unconfirmed potential for archaeological resources (Stantec 2018).

5.4.2 Effects Assessment

For the ROW extensions beyond the original footprint and not included in the previous in-field archaeological assessments, there is potential for Project activities to interact with unrecorded archaeological sites and other Heritage Conservation Act-protected heritage resources. In-field inspections are necessary to identify any interactions. Archaeological sites or other Heritage Conservation Act-protected heritage resources may be identified within the new disturbance areas of the proposed ROW during assessment. Any sites and corresponding interactions that may be identified will be assessed as part of the regulated heritage review process overseen by the BC Archaeology Branch (Stantec 2019). Potential effects on identified archaeology and heritage resources resulting from the Project will be mitigated in accordance with Mt. Milligan's Cultural Heritage Management Plan (TCMC 2017), First Nations' comments, and heritage legislation. Effects on individual archaeological or heritage sites resulting from the Project will be reduced through engineering options, avoidance, or the application of mitigation procedures following the Cultural Heritage Management Plan and following requirements under provincial legislation (2018). If identified, potential impacts to archaeological or heritage sites will be managed in accordance with the provincial Heritage Conservation Act and the Project-specific Cultural Heritage Management Plan (EAO 2009).

5.4.3 Significance

Based on the assessment of potential effects on the Archaeology and Heritage Resources VC and the implementation of the mitigation measures included in the Cultural Heritage Management Plan (TCMC 2017) and the CEMP (2019) the residual effects on archaeology and heritage resources are not likely to be significant. The characterization of these residual effects is unchanged from the assessment provided in the original EAC application.

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6 CUMULATIVE EFFECTS

The assessment methodology of cumulative effects follows the same manner as that of the Amendment 6 Application (Stantec 2018) and original EA. That is, for each VC, a cumulative effects assessment will be conducted if the proposed Project changes adversely alter the characterization of residual effects from the original EAC application and the EAO (2009) Assessment Report. For example, if a residual effect changes from being low magnitude to moderate magnitude or from being reversible to being irreversible.

Given there are negligible to low residual project effects and no new interacting effects from other past, present, and reasonably foreseeable future projects and activities in the regional study areas from that of the EA or the most recent Amendment (#6), there are no cumulative effects identified to any of the VCs from the proposed 25 kV powerline. As such, no cumulative effects assessment has been carried forward.

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7 INDIGENOUS AND ABORIGINAL USE CONSIDERATIONS

7.1 Consultation Activities

The following indigenous groups have been or will be consulted on this application:

- Nak'azdli Whut'en;
- McLeod Lake Indian Band;
- Takla Nation;
- · West Moberly First Nation; and
- Halfway River First Nation

It is TCMC's understanding that the EAO will lead the notification process with the West Moberly and Halfway River First Nations. TCMC will engage with the Nak'azdli Whut'en, McLeod Lake Indian Band and Takla Nation during the amendment process. This is expected to consist of Working Group meetings as well as additional engagement with Nak'azdli Whut'en, McLeod Lake Indian Band, and Takla Nation technical consultants if needed.

7.2 Considerations of Potential Effects

The proposed Project changes may affect the ability of Nak'azdli Whut'en, McLeod Lake Indian Band, West Moberly First Nation, Halfway River First Nation, and Takla Nation members to exercise their Aboriginal Interests, as defined as "asserted or determined Aboriginal rights, including title, and treaty rights."

The assessment conducted for the Project's Amendment 6 Application (Stantec 2018) provided an assessment of effects on the Aboriginal Interests of the Nak'azdli Whut'en, McLeod Lake Indian Band, West Moberly First Nation, and Halfway River First Nation. Takla Nation did not participate in the original EA for the Project. However, since the EAC was issued in 2009, Takla Nation has asserted that their traditional territory includes the area affected by the mine, including the proposed Project changes. As a result, considerations of the Aboriginal Interests for the Takla Nation are included in the same manner as completed for the Amendment #6 Application.

The effects from this Application's Project changes are comparable to those in the Amendment #6 Application. No new information has been obtained since the Amendment 6 Application. Boundaries of the traditional territories and the location of the Mt. Milligan Mine are provided in Stantec (2018).

The assessments presented in the original EAC application and subsequent amendments concluded that there would be no significant adverse effects on either the biophysical environment VCs, or on the cultural heritage resources VC that Indigenous people rely on when exercising their Aboriginal Interests (Terrane Metals Corp. 2008; Stantec 2018).

Potential interactions with Aboriginal Interests associated with the proposed changes to the Project include:

- Effects on traditional practices including hunting, trapping, fishing, and plant gathering
- Effects on access to traditionally harvested resources
- Effects on access to traditional use sites

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• Effects on cultural experience

Mitigation measures to avoid and reduce potential adverse effects on Aboriginal Interests are the same as those identified in Section 7.3 through 7.5 of Stantec (2018) and the Conditions of EAC #M09-01.

Consistent with the EAO's findings regarding the effects of the Project on the Aboriginal Interests in previous amendment applications, the risk of adverse effects on resources needed to exercise Aboriginal interests has been mitigated or avoided due to the relatively small footprint of the proposed Project changes, the mitigation measures that will be implemented and the requirements for reclamation.

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8 SUMMARY

8.1 Residual Effects

In consideration of the interactions between the construction, operation and decommissioning of the 25 kV powerline and associated infrastructure that follows existing disturbance corridors and the proposed mitigation measures, the potential incremental adverse environmental effects for each of the three VCs are predicted to be negligible to low in magnitude, local, long-term in duration (i.e., for the life of the infrastructure), negative, with low environmental consequence. A summary of residual effects, the changes to the characterization of potential effects (relative to those presented in the EAO's Assessment Report) and changes to the determination of significance are summarized in Table 8-1. No cumulative effects are predicted.

Table 8-1 Summary and Characterization of Residual Effects from the Changes in this Amendment

Valued Component	Residual Effects	Change to Characterization of Residual Effects	Change to Determination of Significance
Vegetation and Plant Communities	For loss of plants traditionally used by Indigenous groups, loss of plant habitat or alteration of plant community structure and composition, loss of rare plant species, loss or alteration of plant communities at risk, and vegetation and plant communities overall, the residual effects are predicted to be low to negligible. Small areas of vegetation will be affected by clearing (predicted to be less than 1 ha).	No change to the characterization of residual effects.	No change. Residual effects are predicted to be not significant.
Wildlife and Wildlife Habitat	For change in habitat availability, change in mortality risk, change in movement, and wildlife and wildlife habitat overall, the residual effects are predicted to be low to negligible. Small areas of wildlife habitat will be affected by clearing (predicted to be less than 1 ha).	No change to the characterization of residual effects.	No change. Residual effects are predicted to be not significant.



Table 8.2 (continued) Summary and Characterization of Residual Effects from the Changes in this Amendment

Archeological and Heritage Resources No unmitigated impacts to archaeological or heritage resources are predicted.	No change to the characterization of residual effects (With implementation of the AIA).	No change. Residual effects are predicted to be not significant.
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Note: Table adapted from Stantec (2018)

8.2 Key Mitigation Measures

A summary of mitigation measures identified in the original EAC and Amendment 6 (Stantec 2018) that are applicable to this amendment includes:

1. Vegetation and Plant Communities

- a. Adhere to mitigation measures described in the Table of Proponent Commitments in EAC #M09-01 and in TCMC's existing Landscape, Soils and Vegetation Management Plan (TCMC 2016a in Stantec 2018) and the CEMP (TCMC 2019b).
- b. Avoid wetlands where possible and reduce vegetation removal within riparian areas. Soil, low shrub, and ground cover will be left intact along the powerline routes to the extent possible.
- c. Implement sediment and erosion control measures in areas where soils are disturbed for construction (as per Section 6.3.7.4 of the original EAC application).
- d. Implement the Mine's Invasive Species Management Plan.
- e. Use rig matting to reduce disturbance to wetlands at or near construction areas as necessary.
- f. Undertake active and progressive reclamation where practicable.

2. Wildlife and Wildlife Habitat

- a. Adhere to mitigation measures described in the Table of Proponent Commitments in EAC #M09-01, and in TCMC's existing Wildlife Management Plan (TCMC 2018) and the CEMP (TCMC 2019b).
- b. Undertake active and progressive reclamation of the project footprint following decommissioning of the 25kV powerline and associated infrastructure.

3. Archaeology and Heritage Resources

 Adhere to mitigation measures described in the Table of Proponent Commitments in EAC #M09-01, and in TCMC's existing Cultural Heritage Management Plan (TCMC 2017) and the CEMP (TCMC 2019b).

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8.3 Requested Amendment

With submission of this application, TCMC is seeking an amendment to EAC #M09-01 to allow construction, operation through November 2021, and decommissioning of the proposed powerline with powerline use termination. TCMC is proposing that the Certified Project Description in Amendment #3 is amended to remove the following bullets under Section 3 "Project Components":

- A diesel generator housed, enclosed or otherwise situated to produce a maximum noise level of 68dBA.
- Secondary containment for the generator, fuel tanks and refueling areas.

and that the Certified Project Description in Amendment #6 is amended to add the following bullet under Section 3 "Project Components":

- A powerline within the powerline corridor as identified in Figure x.
- Two sub stations in the locations as identified in Figure x.

TCMC also proposes to amend the wording in the CPD in Amendment #6 to state:

"b. Groundwater wells, pipeline, and utilities (up to 15 hectares of disturbance) within the 6 kilometre buffer of the mine lease (Shown on Figure 1). Groundwater will be pumped for use in mine operations."

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