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5.3.1 Identification and Selection of Valued Components

The approach of selecting Valued Components (VCs) is consistent with the Guideline for the Selection of Valued Components and Assessment of Potential Effects (British Columbia Environmental Assessment Office (BC EAO), September 9, 2013) and requirements under the final Environmental Impact Statement Guidelines (Canadian Environmental Assessment Agency (Agency), 2013) including the terminology and definitions for VCs and indicators. The purpose of this evaluation process is to select VCs that reflect the types of effects identified in the relevant legislation, revealed and identified through the issue scoping process, and to ensure effective, efficient, and focused analysis of potential effects from the proposed Blackwater Gold Project (the Project) (BC EAO, 2013).

Section 4.2 describes the methods used for determination of selected VCs. The process involves three steps:

- Identify Candidate VC;
- Evaluate Candidate VC; and
- Select Appropriate VCs.

The first step is the identification of the candidate VCs, which involves issue scoping. Issue scoping is done by identifying the interaction of the Project components or activities with the five pillars (Environmental, Economic, Social, Heritage, and Health), through consultation with stakeholder groups and by applying professional judgement taking into account environmental assessments conducted in the past on similar projects. Baseline characterization results provide the information to identify relevant candidate VCs representative of the five pillars.

The BC EAO established a Working Group (WG) consisting of provincial and federal regulatory agencies, Aboriginal groups, and identified stakeholder groups likely to be involved in, or affected by the Project. The WG's involvement in the pre-Application stage has focused primarily on reviewing the draft Application Information Requirements (dAIR) that includes information on the candidate VCs for the project. The public also provided comments on the dAIR. The comments from the WG and public on the candidate VCs have been incorporated into the issues scoping process. In addition, the Project-specific issues are generally indicative of local and regional values held by the public, First Nations, and other stakeholders. Issues tracking tables that document issues and concerns raised during the preparation of the AIR and Application are presented in **Appendix 3.1.3A** and **Appendix 3.1.3B**. A summary of consultations is provided in **Appendix 3.1.3C**.

Table 5.3.1-1 includes the rationale for choosing each candidate VC as a result of the issue scoping, including details on the interactions between the candidate VC and Project activities.

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Table 5.3.1-1: Candidate Valued Component Rationale

Valued Component Candidates	Interaction with Project Activities	First Nations ⁽¹⁾	The Public and Other Stakeholders ⁽²⁾	EIS Guidelines
Surface water flow	Proposed mining facilities (TSF, open pit, and water management facilities) and related activities (water withdrawal and discharge) have the potential to affect natural streams, drainage areas, annual flows, seasonal distribution of flow, high and low flows, and lake levels within Creek 661, Chedakuz Creek (which includes Tatelkuz Lake), and Creek 705 catchment areas.	Lhoosk'uz Dene Nation; Ulkatcho First Nation	The general public expressed concern regarding the water source and usage at the mine site (Open House 6 May 2013) Also, the general public voiced concern about migrating birds encountering contaminated waters. Health Canada advises that all sources of drinking water (surface and groundwater) be identified, as well as water used for recreational purposes within the area of influence of the Project (22 May 2013).	9.1.2 Biophysical Environment – Water Resources
Surface water quality	Some discharge to surface waters or ground may occur from sediment ponds during construction. On closure and after pit lake filling, water will be discharged from the main TSF to maintain adequate freeboard in the facility.	Lhoosk'uz Dene Nation; Nazko First Nation; Ulkatcho First Nation; Lhoosk'uz Dene Nation; Saik'uz First Nation	BC MFLNRO asked about contamination in water, specifically Tascha lakes and arsenic (e-mail with BC MFLNRO 20 August 2012). Landowner concerned about impacts to water quality (letter from landowner 24 September 2012).	9.1.2 Biophysical Environment – Water Resources
Sediment quality	Suspended sediment may result from construction activities. Mine site liquid discharges and seepage may result in changes to sediment quality during constructions, operations, closure, and post-closure phases of the Project.	Ulkatcho First Nation; Natural Resources; Lhoosk'uz Dene Nation	No comments noted to date	9.1.2 Biophysical Environment – Water Resources
Groundwater quantity	Mining facilities (TSF, open pit and water management) and activities (water withdrawal and discharge) have the potential to affect groundwater flow in Davidson Creek, Creek 661, Chedakuz (which includes Tatelkuz Lake), and Creek 705 catchments.	No comments noted to date	Impeded ecological function (e.g., impeded or excessive above ground or sub-surface water flow etc). Impaired hydrological regimes that result in loss of function or productivity (LM Forest Resource Solutions Ltd., 2011).	9.1.2 Biophysical Environment – Water Resources
Groundwater quality	Seepage from water management, waste rock and TSF management facilities and contact water from open pit have the potential to affect groundwater quality in Davidson Creek Catchment, Creek 661 Catchment, Chedakuz Catchment which includes Tatelkuz Lake, and Creek 705 catchment.	Ulkatcho First Nation	No comments noted to date	9.1.2 Biophysical Environment – Water Resources
Wetlands	Land clearing and construction of Project facilities has the potential generate loss of wetland ecosystems as well as alter wetland function.	Saik'uz First Nation	Wetland ecosystems because: they provide a range of important ecological services (e.g., regulating hydrological systems, carbon storage, providing biological diversity, and because they support unique fauna and flora considered to be important by stakeholders), they are easily degraded if feeder streams or soil water movement is compromised, are susceptible to a warmer climate, and they are not explicitly managed under other another program Wetlands are important to local naturalists (Vanderhoof Ecosystem Restoration Strategic Plan, LM Forest Resource Solutions Ltd. 2011).	9.1.2 Biophysical Environment – Wetlands 9.1.2 Biophysical Environment – Fish and Fish Habitat
Fish	Resident and adfluvial fish are found in most stream and lake habitats within the Project area. Construction, operations, and closure of proposed mine site facilities have the potential to affect fish distribution and health.	Ulkatcho First Nation; Nazko First Nation	Denis and June Wood	9.1.2 Biophysical Environment – Fish and Fish Habitat

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Valued Component Candidates	Interaction with Project Activities	First Nations ⁽¹⁾	The Public and Other Stakeholders ⁽²⁾	EIS Guidelines
Fish habitat	Fish are found in most stream and lake habitats within the Project area. Proposed mine site facilities have the potential to affect fish and fish habitat including: habitat loss because of footprint overlap, habitat isolation upstream of mine site facilities, habitat effects due to changes in flow downstream of the facilities and riparian effects due to transmission corridor and mine access road clearing.	Lhoosk'uz Dene Nation	BC MFLNRO	9.1.2 Biophysical Environment – Fish and Fish Habitat
Acid Rock Drainage Metal / Metal Leaching	Mining involves the excavation of waste rock and ore. Mine waste is deposited on surface and has the potential to generate acid rock drainage and metal leaching.	Natural Resources; Lhoosk'uz Dene	No comments noted to date.	9.1.2 Biophysical Environment – Acid Rock Drainage/Metal Leaching
Mountain Whitefish	Mountain whitefish may occupy areas in the footprint of Project facilities and activities.	Ulkatcho First Nation	No comments noted to date	9.1.2 Biophysical Environment - Fish and Fish Habitat
Char	Char may occupy areas in the footprint of Project facilities and activities.	Lhoosk'uz Dene Nation	No comments noted to date	9.1.2 Biophysical Environment - Fish and Fish Habitat
Lingcod/Burbot	Lingcod/Burbot may occupy areas in the footprint of Project facilities and activities.	Lhoosk'uz Dene Nation	No comments noted to date	9.1.2 Biophysical Environment - Fish and Fish Habitat
White Sturgeon (<i>Acipenser transmontanus</i>)	A population of white sturgeon (<i>Acipenser transmontanus</i>) is present in the Nechako River. The Nechako River is outside the aquatic RSA of this Project mine site, but it will be crossed by the transmission line.	No comments noted to date	The Nechako white sturgeon population was red-listed by the province in 2010 (BC CDC, 2013). Its conservation status is S1 or “critically imperilled” due to long-term reproductive failure that began in the 1960s after the river was dammed for purposes of hydroelectric power production. In 2003, COSEWIC classified the Nechako sturgeon as “endangered” (COSEWIC, 2003; Ptolemy and Vennesland, 2003).	9.1.2 Biophysical Environment - Fish and Fish Habitat
Benthic Macroinvertebrates Periphyton	Benthic macroinvertebrates, Periphyton occupy areas in the footprint of Project facilities and activities.	No comments noted to date	No comments noted to date	9.1.2 Biophysical Environment - Fish and Fish Habitat

Note: ⁽¹⁾ “First Nation” concerns are from comments in the tracking tables in reference to Version A through F of the dAIR.

⁽²⁾ “The Public and Other Stakeholders” comments do not include comments specific to study design, methods proposed for sampling. Concerns are from comments in the tracking tables in reference to Version A through F of the dAIR.
BC MFLNRO = British Columbia Ministry of Forests, Lands and Natural Resource Operations; EIS = Environmental Impact Statement; TSF = Tailings Storage Facility
Refer to **Table 4.3-2** Project Component and Activity Interaction Matrix for Selected VCs

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The second step is the evaluation of the candidate VCs to selected VCs. The candidate VCs were examined to confirm if they would interact with Project components and activities, and if those interactions would result in an environmental effect. Key interactions were identified as those that had a greater potential to result in adverse effects of higher significance. The evaluation also used the VC attributes and key questions from the Guideline for the Selection of Valued Components and Assessment of Potential Effects, as is presented in **Table 5.3.1-2**.

In the evaluation process, if all attributes and questions were confirmed and answered with “Yes,” the candidate VC becomes a selected VC. If “No” was answered to one or more of the attributes or evaluation questions, the candidate VC was not considered as a selected VC, unless it was a confirmed to be a component of concern. The outcome of the interactive process is a shorter list of VCs that appropriately reflects the concerns raised and the aspects of the broader environment that are of most value to society. This list allows the assessment to focus on key issues for decision-makers and to address key concerns. **Section 4, Table 4.3-2** (Project Component and Activity Interaction Matrix) shows the potential key and moderate interactions between Project activities and components of the selected VCs.

The evaluation resulted in eight candidate VCs being determined to be selected VCs for the Aquatic Environment, which are as follows:

- Surface Water Flow;
- Surface Water Quality;
- Sediment Quality;
- Groundwater Quantity;
- Groundwater Quality;
- Wetlands;
- Fish; and
- Fish Habitat.

The evaluation process also resulted in several candidate VCs not chosen as selected VCs. Further rationale for not selecting these candidates VCs is show in **Table 5.3.1-3**.

The federal *Species At Risk Act (SARA)* (Government of Canada, 2002) list white sturgeon (*Acipenser transmontanus*). White sturgeon is present in the Nechako River however; it is outside the aquatic RSA of the Project mine site and is not chosen as a selected VC. The interaction with the transmission line and the Nechako River is slight and no effects on the river are anticipated from this interaction.

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Indicators are identified as required to further focus the analysis of interactions between the Project and the selected VC. Indicators are aspects of the VC used to understand and evaluate the potential effect on the VC. They may comprise a species group, guild, or sub-population, or some other functional aspect, such as habitat, that is important to the integrity of the VC.

To be effective and useful, indicators must have the following attributes from the Guideline for the Selection of Valued Components and Assessment of Potential Effects. The rationale for the indicators proposed for the selected VCs is shown in **Table 5.3.1-4**.

Table 5.3.1-2: Evaluation of Candidate Valued Components

Subject Area	Candidate VC	Attributes					Evaluation Key Questions				
		Relevant ⁽¹⁾	Comprehensive ⁽²⁾	Representative ⁽³⁾	Responsive ⁽⁴⁾	Concise ⁽⁵⁾	Measurable ⁽⁶⁾	Grouping ⁽⁷⁾	Ultimate Receptor ⁽⁸⁾	Component of Concern ⁽⁹⁾	Selected VC (Included or Excluded)
Aquatic Environment	Surface Water Flow	Y – Applicable to the Environmental Pillar	Y – VC needed to have full understanding of the Environmental Pillar and Aquatic Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC is measureable by using appropriate indicator such as water flow and lake level	Y – The potential effects of the candidate VC cannot be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	Y – Surface Water Flow is a selected VC Included
	Surface Water Quality	Y – Applicable to the Environmental Pillar	Y – VC needed to have full understanding of the Environmental Pillar and Aquatic Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC has measureable parameters	Y – The potential effects of the candidate VC cannot be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	Y – Surface Water Quality is a selected VC Included
	Sediment Quality	Y – Applicable to the Environmental Pillar	Y – VC needed to have full understanding of the Environmental Pillar and Aquatic Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC has measureable parameters	Y – The potential effects of the candidate VC cannot be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	Y – Sediment Quality is a selected VC Included
	Groundwater Flow	Y – Applicable to the Environmental Pillar	Y – VC needed to have full understanding of the Environmental Pillar and Aquatic Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC is measureable by using appropriate indicator such as ground water level	Y – The potential effects of the candidate VC cannot be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	Y – Groundwater Flow is a selected VC Included
	Groundwater Quality	Y – Applicable to the Environmental Pillar	Y – VC needed to have full understanding of the Environmental Pillar and Aquatic Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC has measureable parameters	Y – The potential effects of the candidate VC cannot be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	Y – Groundwater Quality is a selected VC Included
	Acid Rock Drainage Metal / Metal Leaching	Y – Applicable to the Environmental Pillar	Y – VC needed to have full understanding of the Environmental Pillar and Aquatic Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC has measureable parameters	N – The potential effects of the candidate VC can be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	N – Acid Rock Drainage Metal / Metal Leaching is not a selected VC Excluded
	Wetlands	Y – Applicable to the Environmental Pillar	Y – VC needed to have full understanding of the Environmental Pillar and Aquatic Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC is measureable by using appropriate indicators such as hydrological, biochemical, ecological, and habitat functions	Y – The potential effects of the candidate VC cannot be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	Y – Wetlands is a selected VC Included
	Fish	Y – Applicable to the Environmental Pillar	Y – VC needed to have full understanding of the Environmental Pillar and Aquatic Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC is measureable by using appropriate indicators such as rainbow trout and Kokanee	Y – The potential effects of the candidate VC cannot be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	Y – Fish is a selected VC Included

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Subject Area	Candidate VC	Attributes					Evaluation Key Questions				
		Relevant ⁽¹⁾	Comprehensive ⁽²⁾	Representative ⁽³⁾	Responsive ⁽⁴⁾	Concise ⁽⁵⁾	Measurable ⁽⁶⁾	Grouping ⁽⁷⁾	Ultimate Receptor ⁽⁸⁾	Component of Concern ⁽⁹⁾	Selected VC (Included or Excluded)
Aquatic Environment	Fish Habitat	Y – Applicable to the Environmental Pillar	Y – VC needed to have full understanding of the Environmental Pillar and Aquatic Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC is measurable by using appropriate indicators such as surface water flow, surface water and sediment quality, groundwater flow and quality, ecological health and riparian habitat	Y – The potential effects of the candidate VC cannot be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	Y – Fish Habitat is a selected VC Included
	Mountain Whitefish	Y – Applicable to the Environmental Pillar	N – VC needed to have full understanding of the Environmental Pillar and Terrestrial Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC has measurable parameters	N – The potential effects of the candidate VC can be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	N – Mountain Whitefish is not a selected VC Excluded
	Char	Y – Applicable to the Environmental Pillar	N – VC needed to have full understanding of the Environmental Pillar and Terrestrial Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC has measurable parameters	N – The potential effects of the candidate VC can be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	N – Char is not a selected VC Excluded
	Lingcod/Burbot	Y – Applicable to the Environmental Pillar	N – VC needed to have full understanding of the Environmental Pillar and Terrestrial Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC has measurable parameters	N – The potential effects of the candidate VC can be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	N – Lingcod/Burbot is not a selected VC Excluded
	White Sturgeon (<i>Acipenser transmontanus</i>)	Y – Applicable to the Environmental Pillar	N – VC needed to have full understanding of the Environmental Pillar and Terrestrial Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	N – Clear interaction with project activities and/or project component	Y – VC has measurable parameters	Y – The potential effects of the candidate VC cannot be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	N – White Sturgeon (<i>Acipenser transmontanus</i>) is not a selected VC Excluded
	Benthic macroinvertebrates Periphyton	Y – Applicable to the Environmental Pillar	N – VC needed to have full understanding of the Environmental Pillar and Terrestrial Environment subject area	Y – VC is illustrative of the natural and human environments to be possibly affected by the proposed project	Y – VC is responsive to the potential project effects	Y – Clear interaction with project activities and/or project component	Y – VC has measurable parameters	N – The potential effects of the candidate VC can be effectively represented by another VC	N – VC is an intermediate receptor not the end point in the effects pathway	Y – VC is raised as a concern though the issues scoping process	N – Benthic Macroinvertebrates Periphyton is not a selected VC Excluded

Note: ⁽¹⁾ Relevant to one of the five pillars (environmental, economic, social, heritage and health) and clearly linked to the values reflected in the issues raised in respect to the project; ⁽²⁾ Comprehensive, taken together, the VCs selected for an assessment should enable a full understanding of the important potential effects of the project; ⁽³⁾ Representative of the important features of the natural and human environment likely to be affected by the project; ⁽⁴⁾ Responsive to the potential effects of the project; ⁽⁵⁾ Concise, so the nature of the project-VC interaction and the resulting effect pathway can be clearly articulated and understood, and overlapping or redundant analysis is avoided; ⁽⁶⁾ Measurable, the potential effects of the project on the VC can be measured and monitored; ⁽⁷⁾ Grouping, the potential effects of the candidate VC cannot be effectively represented by another VC; ⁽⁸⁾ Ultimate Receptor, the ultimate receptors are humans; ⁽⁹⁾ Component of Concern, includes issues and/or legislation raised by FNs, Federal or Provincial governments;
N = No; VC = Valued Component; Y = Yes
Refer to **Table 4.3-2** Project Component and Activity Interaction Matrix for Selected VCs

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Table 5.3.1-3: Candidate Valued Components Not Selected

Candidate Valued Component and Indicators	Rationale
Acid Rock Drainage / Metal Leaching	<ul style="list-style-type: none"> An Acid Rock Drainage analysis will be completed and this information will be used to inform the effects assessment for change in water quality within the Surface Water and Sediment Quality and Groundwater Quality VCs.
Mountain Whitefish	<ul style="list-style-type: none"> Baseline surveys demonstrate that mountain whitefish are present in the LSA; results of engagement with First Nation groups since 2011 have not indicated past or current harvesting of mountain whitefish within the study areas.
Char	<ul style="list-style-type: none"> No char species were found in the aquatic LSA (including Tatelkuz Lake, Davidson Creek, and Chedakuz Creek). Three years of sampling streams and lakes of the LSA have shown there are no char species present in the LSA; therefore char were not selected as an indicator.
Lingcod/Burbot	<ul style="list-style-type: none"> Lingcod is not present in the LSA. Burbot may be what is meant by the term Lingcod; however, there is inconclusive evidence about the presence of burbot in the LSA.
White Sturgeon (<i>Acipenser transmontanus</i>)	<ul style="list-style-type: none"> A population of white sturgeon (<i>Acipenser transmontanus</i>) is present in the Nechako River. The Nechako River is outside the aquatic RSA of the Project mine site, but it will be crossed by the transmission line. The interaction of the transmission line and the Nechako River is slight and no effects are anticipated on Fish and Fish Habitat.
Benthic Macroinvertebrates Periphyton	<ul style="list-style-type: none"> There are two reasons why primary and secondary producers (i.e., periphyton and benthic macroinvertebrates in streams and phytoplankton, zooplankton, and benthic macroinvertebrates in lakes) are considered to be subsumed by the two indicator species (i.e., rainbow trout and Kokanee) for the Fish VC: <ul style="list-style-type: none"> Fish are more highly valued than periphyton or zooplankton. Any effect of mine activities on primary and secondary producers will also directly affect the growth, survival, and reproduction of the two dominant fish species of the fish community.

Note: EA = Environmental Assessment; LSA = Local Study Area; RSA = Regional Study Area; SARA = *Species at Risk Act*; VC = Valued Component
 Refer to **Table 4.3-2** Project Component and Activity Interaction Matrix for Selected VCs

Table 5.3.1-4: Selected Valued Components and Rationale of Indicators and/or Factor

Pillar	Valued Components	Indicators and/or Factors for Assessment	Rationale of Indicator and/or Factor⁽¹⁾
Environment	Surface Water Flow	<ul style="list-style-type: none"> Water flow Lake level 	The Project has the potential, with its water diversion, water management, and withdrawal activities, to affect surface water flows within these watersheds and Tatelkuz Lake levels during construction, operation, closure, and post-closure. In addition, the alteration of surface water flows and Tatelkuz Lake levels has the potential to affect other Project VCs, such as surface water and sediment quality, and fish and fish habitat. Therefore, the scoping process concluded that surface water flows and lake levels are key indicators/factors for assessment.
	Surface Water Quality	<ul style="list-style-type: none"> Measured parameters (e.g., pH and heavy metals) Acid Rock Drainage / Metal Leaching Geochemistry 	The indicators selected represent baseline conditions and are in correlation with the applicable standards and guidelines for British Columbia and Canada. They can capture potential effects of the Project on surface water quality.
	Sediment Quality	<ul style="list-style-type: none"> Measured parameters (e.g., pH and heavy metals) Acid Rock Drainage / Metal Leaching Geochemistry 	The indicators selected are in correlation with the applicable standards and guidelines for British Columbia and Canada. They can capture potential effects of the Project on sediment quality.
	Groundwater Flow	<ul style="list-style-type: none"> Groundwater level Groundwater flow 	The indicator selected represents baseline conditions and are in correlation with the applicable standards and guidelines for British Columbia and Canada. They capture potential effects of the Project on groundwater flow.
	Groundwater Quality	<ul style="list-style-type: none"> Measured parameters (e.g., pH and heavy metals) Acid Rock Drainage / Metal Leaching Geochemistry 	The indicators selected represent baseline conditions and are in correlation with the applicable standards and guidelines for British Columbia and Canada. They can capture potential effects of the Project on groundwater quality.
	Wetlands	<ul style="list-style-type: none"> Hydrological function Biochemical function Ecological function Habitat function 	The indicators used qualitatively assessed by documenting wetland functions per federal wetland class, calculating lost area of each wetland class, and then evaluating degraded wetland functions and hydrologically altered wetlands.
	Fish Habitat	<ul style="list-style-type: none"> Surface water flow Surface water and sediment quality Ecological health Riparian habitat 	These measurable parameters are chosen because it can capture potential effects of the Project on fish habitat.
	Fish	<ul style="list-style-type: none"> Rainbow trout Kokanee 	<p>The two indicator species were selected because they are the two most numerous fish species in the LSA and RSA, they are both food fish that are targets of recreational and Aboriginal fisheries, and they both use stream and lake habitat (although at different times of the year). Equally important, they have sufficiently different diets, habitat preferences, and seasonal life history timing that any potential effect of Project activities on fish and fish habitat in streams and lakes of the LSA and RSA will inevitably affect one or both species. Therefore, these two fish species are relevant, comprehensive, representative, responsive, and measurable indicators for the entire fish community of the LSA and RSA.</p> <p>Kokanee are the most numerous fish in Tatelkuz Lake (the only Kokanee residence lake in the LSA), and they are the single most numerous fish in the LSA when they emerge from Tatelkuz Lake to spawn in streams in mid- to late summer.</p> <p>Rainbow trout is the second most numerous fish species in Tatelkuz Lake, and the predominant fish species in three of the four headwater lakes of the LSA. (Lake chub, <i>Couesius plumbeus</i>, is the only fish species present in Snake Lake.) Except during the Kokanee spawning migration, rainbow trout are the predominant fish species in streams of the LSA and RSA. Adult rainbow trout emerge from their residence lakes in spring to spawn in streams and then return to lakes. Juvenile rainbow trout remain in streams for up to 2 years before migrating to residence lakes for adult life.</p> <p>The selection of two of the 12 fish species present in the LSA as fish VC indicators does not mean that information on the other ten species is not important. Fish species richness in each stream and lake of the LSA and RSA is summarized in this section because it increases directly with increasing habitat diversity, which is usually positively correlated with waterbody size (Griffiths, 1997).</p> <p>The conservation status of each fish species, regardless of its abundance in the LSA, is also an indicator of ecological health because the presence and abundance of vulnerable, threatened, or endangered species is an indicator of habitat diversity.</p>

Note: ⁽¹⁾Included indicators follow these attributes: *Relevant*: indicators must relate directly or indirectly to the integrity of the selected VC; *Practical*: there must be a practical way to evaluate the indicator, using existing or achievable data, predictive models, or the means; *Measurable*: the measurement of the selected indicator must generate useful data that inform our understanding of the potential effect on the VC; *Responsive* to the potential effects of the project; *Predictable* in terms of their response to the project.
 LSA = Local Study Area; RSA = Regional Study Area; VC = Valued Component
 Refer to **Table 4.3-2** Project Component and Activity Interaction Matrix for Selected VCs