ARTEMIS GOLD INC | Blackwater Mine

Construction Environmental Management Plan

This document supersedes the Early Works Construction Environmental Management Plan for works conducted under the *Mines Act* Permit M-246 and *Environmental Management Act* Permit 110602.

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Acronyms and Abbreviations

AEMP	Aquatic Effects Monitoring Program
AQDMP	Air Quality and Fugitive Dust Management Plan
Artemis	Artemis Gold Inc.
BC	British Columbia
BC EAO	BC Environmental Assessment Office
BC EMLI	BC Ministry of Energy, Mines and Low Carbon Innovation
BC EMPR	BC Ministry of Energy, Mines and Petroleum Resources
BC ENV	BC Ministry of Environment and Climate Change Strategy
BC MOE	BC Ministry of Environment
BC MOF	BC Ministry of Forests
Blackwater	Blackwater Gold Project
BMP	Best Management Practice
BW Gold	BW Gold LTD.
CEMP	Construction Environmental Management Plan
CEO	Chief Executive Officer
CM	Construction Manager
CMMP	Caribou Mitigation and Monitoring Plan
CMSTHP	Chemicals and Materials Storage, Transfer and Handling Plan
Code	Health, Safety and Reclamation Code for Mines in British Columbia
COO	Chief Operating Officer
CPD	Certified Project Description
DFO	Fisheries and Oceans Canada
DS	Decision Statement
EAC	Environmental Assessment Certificate
ECCC	Environment and Climate Change Canada
EIR	Environmental Incident Report
ELoMC	Environmental Life of Mine Committee
EM	Environmental Manager
EMBC	Emergency Management BC
EMS	Environmental Management System
EOR	Engineer of Record

EPCM	Engineering, Procurement, and Construction Management
ERT	Emergency Response Team
ESC	Erosion and Sediment Control
FLNRORD	Ministry of Forests, Lands, Natural Resource Operations, and Rural Development
FMSCP	Fuel Management and Spill Control Plan
FSR	Forest Service Road
FWR	Freshwater Reservoir
GM	General Manager
IECD	Interim Environmental Control Dam
IFC	Issued for Construction
Indigenous nations[1]	Ulkatcho First Nation, Lhoosk'uz Dené Nation, Nadleh Whut'en First Nation, Stellat'en First Nation, Saik'uz First Nation, and Nazko First Nation (as defined in the Project's Environmental Assessment Certificate #M19-01)
IPMP	Invasive Plants Management Plan
IRTB	Independent Tailings Review Board
Joint MA/EMA Application	Joint *Mines Act/Environmental Management Act* Application
km	Kilometer
kV	Kilovolt
LDN	Lhoosk'uz Dené Nation
LPU	Local Population Unit
m	Meter
MAR	Mine Access Road
MASL	Meters above sea level
MERP	Mine Emergency Response Plan
ML/ARD	Metal Leaching/Acid Rock Drainage
ML/ARDMP	Metal Leaching/Acid Rock Drainage Management Plan
MSDP	Mine Site Water and Discharge Monitoring and Management Plan
MSTCP	Mine Site Traffic Control Plan
Mtpa	Million tonnes per annum
NAG	Non acid generating
New Gold	New Gold Inc.
NPR	Neutralization potential ratio

NTU	Nephelometric turbidity unit
NVMP	Noise and Vibration Management Plan
PAG	Potentially acid generating
PASS	Passive Air Sampling System
PCR	Project Completion Report
PFZ	Pesticide Free Zone
PPE	Personal Protective Equipment
QA/QC	Quality assurance/quality control
RCP	Reclamation and Closure Plan
RMA	Riparian Management Area
RoW	Right-of-Way
SCP	Sediment Control Pond
SEPSCP	Surface Erosion Prevention and Sediment Control Plan
SMP	Soil Management Plan
SOP	Standard Operating Procedure
t/d	Tonnes/day
TARP	Trigger Action Response Plan
TSF	Tailings Storage Facility
TSS	Total suspended solids
UFN	Ulkatcho First Nation
VMP	Vegetation Monitoring Plan
VP	Vice President
WMMP	Wildlife Mitigation and Monitoring Plan
WMOP	Wetland Management and Offsetting Plan
WMP	Waste (Refuse and Emissions) Management Plan
WTP	Water Treatment Plant

[1]Indigenous nations replaces the term 'Aboriginal Groups' defined in the Project's Environmental Assessment Certificate #M19-01.

1.0 Project Overview

The Blackwater Gold Project (the Project) is a gold and silver open pit mine located in central British Columbia (BC), approximately 112 kilometres (km) southwest of Vanderhoof, 160 km southwest of Prince George, and 446 km northeast of Vancouver.

The Project is presently accessed via the Kluskus Forest Service Road (FSR), the Kluskus-Ootsa FSR and an exploration access road, which connects to the Kluskus-Ootsa FSR at km 142. The Kluskus FSR joins Highway 16 approximately 10 km west of Vanderhoof. A new, approximately 13.8 km road (Mine-Access Road) will be built to replace the existing exploration access road, which will be decommissioned. The new planned access is at km 124.5. Driving time from Vanderhoof to the mine site is about 2.5 hours.

Major mine components include a tailings storage facility (TSF), ore processing facilities, waste rock, overburden and soil stockpiles, borrow areas and quarries, water management infrastructure, water treatment plants, accommodation camps and ancillary facilities. The gold and silver will be recovered into a gold-silver doré product and shipped by air and/or transported by road. Electrical power will be supplied by a new approximately 135 km, 230 kilovolt overland transmission line that will connect to the BC Hydro grid at the Glenannan substation located near the Endako mine, 65 km west of Vanderhoof.

The Blackwater mine site is located within the traditional territories of Lhoosk'uz Dené Nation (LDN), Ulkatcho First Nation (UFN), Skin Tyee Nation, and Tsilhqot'in Nation. The Kluskus and Kluskus-Ootsa FSRs and Project transmission line cross the traditional territories of Nadleh Whut'en First Nation (NWFN), Saik'uz First Nation (SFN), and Stellat'en First Nation (StFN; collectively, the Carrier Sekani First Nations) as well as the traditional territories of the Nazko First Nation (NFN), Nee Tahi Buhn Band, Cheslatta Carrier Nation, and Yekooche First Nation (BC EAO 2019a, 2019b).

Project construction is anticipated to take two years. Mine development will be phased with an initial milling capacity of 15,000 tonnes per day (t/d) for the first five years of operation. After the first five years, the milling capacity will increase to 33,000 t/d for the next five-years, and to 55,000 t/d in Year +11 until the end of the 23-year mine life. The Closure Phase is Year +24 to approximately Year +45, ending when the Open Pit has filled to the target closure level and the TSF is allowed to passively discharge to Davidson Creek via a closure spillway. The Post-closure phase begins in Year +46.

New Gold Inc. received Environmental Assessment Certificate #M19-01 (EAC) on June 21, 2019 under the *2002 Environmental Assessment Act* (BC EAO 219c) and a Decision Statement (DS) on April 15, 2019 under the *Canadian Environmental Assessment Act, 2012* (CEA Agency 2019). In August 2020, Artemis Gold Inc. (Artemis) acquired the mineral tenures, assets, and rights in the Blackwater Project that were previously held by New Gold Inc. On August 7, 2020, the Certificate was transferred to BW Gold LTD. (BW Gold), a wholly-owned subsidiary of Artemis, under the *2018 Environmental Assessment Act*. The Impact Assessment Agency of Canada notified BW Gold on September 25, 2020 to verify that written notice had been provided within 30 days of the change of proponent as required in Condition 2.16 of the DS, and that a process had been initiated to amend the DS.

BW Gold received *Mines Act* Permit M-246 on June 22, 2021, and *Environmental Management Act* Permit PE-110602 on June 24, 2021, authorizing early construction works for the Project. These works include clearing, grubbing ditching, and site levelling at the Plant Site location and sediment and erosion controls, including construction of ditches, diversions, and a sediment control pond (SCP). BW Gold received an amended *Mines Act* Permit M-246 on March 8, 2023, approving the Mine Plan and Reclamation Program and superseding the previous version. BW Gold received an amended *Environmental Management Act* Permit PE-110602 on May 2, 2023, authorizing discharge of effluent to surface water and groundwater from the Blackwater mine.

2.0 Purpose and Objectives

The purpose of the Construction Environmental Management Plan (CEMP) is to identify measures to minimize and manage potential environmental risks during initial Project construction (Year -1 and Year -2) and during any subsequent construction projects with similar potential risks to environment on site during operations, closure and post-closure. Prime contractors may also have their own environmental management plans, which will be reviewed by BW Gold for alignment with, at a minimum, the requirements in the CEMP. Construction projects are expected to occur at discrete project sites throughout the life of mine, and this CEMP can be adapted to support such discrete operational construction projects.

The objectives of the CEMP are to:

- Identify procedures and mitigation measures to manage construction-related environmental impacts; and
- Identify roles and responsibilities associated with environmental management.

The CEMP addresses the requirements in Section 9.4 of the Joint Application Information Requirements (JAIR) for *Mines Act* and *Environmental Management Act* Permits (EMPR & ENV 2019). Standalone construction environmental management plans will be developed for specific components (where and when required) in conjunction with Issued for Construction plans and the construction execution plan.

The management plans referenced in the CEMP are listed below and provided as attachments, in the order listed below.

Attachment List

- Attachment 1: Air Quality and Fugitive Dust Management Plan (AQDMP);
- Attachment 2: Aquatic Effects Monitoring Program (AEMP);
- Attachment 3: Caribou Mitigation and Monitoring Plan (CMMP);
- Attachment 4: Chemicals and Materials Storage, Transfer and Handling Plan (CMSTHP; includes the Cyanide Management Plan as Appendix A);
- Attachment 5: Cultural and Spiritual Resources Management Plan;
- Attachment 6: Fuel Management and Spill Control Plan (FMSCP);
- Attachment 7: Invasive Plant Management Plan (IPMP);
- Attachment 8: Metal Leaching/Acid Rock Drainage (ML/ARD) Management Plan (ML/ARDMP);
- Attachment 9: Mine Emergency Response Plan (MERP);
- Attachment 10: Mine Site Traffic Control Plan (MSTCP);
- Attachment 11: Mine Site Water and Discharge Management Plan (MSDP);
- Attachment 12: Noise and Vibration Management Plan (NVMP);
- Attachment 13: Occupational Health and Safety Program;
- Attachment 14: Reclamation and Closure Plan (RCP);
- Attachment 15: Soil Management Plan (SMP);
- Attachment 16: Surface Erosion Prevention and Sediment Control Plan (SEPSCP);
- Attachment 17: Vegetation Management Plan (VMP);
- Attachment 18: Waste (Refuse and Emissions) Management Plan (WMP);
- Attachment 19: Wetland Management and Offsetting Plan (WMOP); and
- Attachment 20: Wildlife Mitigation and Monitoring Plan (WMMP).

Standard Operating Procedures (SOP) have been appended to some plans and are also referenced in the CEMP (Table 2-1). The CEMP also refers to the Amphibian Salvage SOP that will be developed prior to construction activities that require amphibian salvage.

Table 2-1: Standard Operating Procedures Relevant to the Construction Environmental Management Plan

Management Plan	Standard Operating Procedures
Air Quality and Fugitive Dust Management Plan	• Fugitive Dust Management Standard Operating Procedure
Invasive Plant Management Plan	• Invasive Plant Management Standard Operating Procedure • Invasive Plant Monitoring Standard Operating Procedure
Vegetation Management Plan	• Old Growth Forest Standard Operating Procedure • Rare and At-Risk Plant Species Management Standard Operating Procedure • Riparian Area Management Standard Operating Procedure • Wetlands Management Standard Operating Procedure • Coarse Woody Debris Management
Metal Leaching/Acid Rock Drainage Management Plan	• Waste Rock and Ore Grade Control Monitoring Standard Operating Procedure • Overburden Monitoring Standard Operating Procedure

Transmission Line Management Plans relevant to the CEMP have been appended to the CEMP and are listed below.

Appended Transmission Line Management Plans

- Appendix J: Transmission Line Construction Environmental Management Plan;
- Appendix K: Transmission Line Surface Erosion Prevention and Sediment Control
- Appendix L: Transmission Line Integrated Vegetation Management Plan
- Appendix M: Transmission Line Industrial and Domestic Waste Management Plan
- Appendix N: Transmission Line Fuel Management and Spill Control Management Plan

3.0 Roles and Responsibilities

BW Gold has the obligation of ensuring that commitments are met and that relevant obligations are made known to mine personnel and site contractors during all phases of the mine life. A clear understanding of the roles, responsibilities, and level of authority that employees and contractors have when working at the mine site is essential to meet EMS objectives.

Table 3-1 provides an overview of general environmental management responsibilities during all phases of the mine life for key positions that will be involved in environmental management. Other positions not specifically listed in Table 3-1 that will provide supporting roles include independent environmental monitors, an Engineer of Record for each tailings storage facility and dam, an Independent Tailings Review Board, TSF qualified person, geochemistry QRP, and other qualified persons and QRPs.

Table 3-1: Blackwater Roles and Responsibilities

Role	Responsibility
Chief Executive Officer (CEO)	The CEO is responsible for overall Project governance. Reports to the Board.
Chief Operating Officer (COO)	The COO is responsible for engineering and Project development and coordinates with the Mine Manager to ensure overall Project objectives are being managed. Reports to the CEO.
Vice President (VP) Environment & Social Responsibility	The VP Environment & Social Responsibility is responsible for championing the Environmental Policy Statement and EMS, establishing environmental performance targets and overseeing permitting. Reports to the COO.
General Manager (GM) Development	The GM is responsible for managing project permitting, the Project's administration services and external entities, and delivering systems and programs that ensure Artemis's values are embraced and supported, Putting People First, Outstanding Corporate Citizenship, High Performance Culture and Rigorous Project Management and Financial Discipline. Reports to the COO.
Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, EMS implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate some of their responsibilities to other qualified personnel. Reports to the GM.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. Reports to the GM.
Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and Management Plans. The EM or designate will be responsible for reporting non-compliance to the CM, and EPCM contractor, other contractors, the Company and regulatory agencies, where required. The EM informs the Environmental Monitors of current site conditions that may influence monitoring programs. Supports the CM and reports to the Mine Manager.
Departmental Managers	Departmental Managers are responsible for implementation of the EMS relevant to their areas. Report to the Mine Manager.

Role	Responsibility
Indigenous Relations Manager	Indigenous Relations Manager is responsible for Indigenous engagement throughout the life of mine. Also responsible for day-to-day management and communications with Indigenous groups. Reports to the VP Environment & Social Responsibility.
Community Relations Advisor	Community Relations Advisor is responsible for managing the Community Liaison Committee and Community Feedback Mechanism. Reports to the Indigenous Relations Manager.
Environmental Monitors	Environmental Monitors (Environmental Specialists and Technicians, including CPESC) are responsible for tracking and reporting on environmental permit obligations through field-based monitoring programs. Report to the EM.
Aboriginal Monitors	Aboriginal Monitors are required under EAC #M19-01 Condition 17 and will be responsible for monitoring for potential effects from the Project on the Indigenous interests. Aboriginal Monitors will be involved in the adaptive management and follow-up monitoring programs. Report to the EM.
Employees and Contractors	Employees are responsible for being aware of permit requirements specific to their roles and responsibilities. Report to departmental managers.
Qualified Registered Professionals and Qualified Persons	Qualified registered professionals and qualified persons will be retained to review objectives and conduct various aspects of environmental and social monitoring as specified in Environmental and Social Management Plans.

BW Gold will employ a qualified person as an EM who will ensure that throughout the construction phase the EMS requirements are established, implemented and maintained, and that environmental performance is reported to management for review and action. The EM is responsible for retaining the services of qualified persons or QRPs with specific scientific or engineering expertise to provide direction and management advice in their areas of specialization. The EM will be supported by Environmental Monitors that will include Environmental Specialists and Technicians and by a consulting team of subject matter experts in the fields of environmental science and engineering.

During the Construction phase, BW Gold will be entering into multiple Engineering, Procurement and Construction contracts, likely for the Transmission Line, Process Plant, Tailings and Reclaim System, and 25 kV Power Distribution. Each engineer/contractor will have their own CM and there will be a BW Gold responsible project manager and/or Superintendent who ultimately reports to the GM Development. Some of the scope, such as the TSF and Water Management Structures will be self-performed by BW Gold, likely using hired equipment. Other smaller scope packages may be in the form of Engineering, Procurement and Construction Management (EPCM) contracts. The EPCM contractors will report to the CMs who will ultimately be responsible for ensuring that impacts are minimized, and environmental obligations are met during the Construction phase. For non-EPCM contractors, who will perform some of the minor works on site, the same reporting structure, requirements, and responsibilities will be established as outlined above. BW Gold will maintain overall responsibility for management of the construction and operation of the mine site and will therefore be responsible for establishing employment and contract agreements, communicating environmental requirements, and conducting periodic reviews of performance against stated requirements.

The CM is accountable for ensuring that environmental and regulatory commitments/obligations are being met during the construction phase. The EM will be responsible for ensuring that construction activities are proceeding in accordance with the objectives of the EMS and associated management plans. The EM or

designate will have the authority to stop any construction activity that is deemed to pose a risk to the environment, or is conducted without regard to established SOPs; work will only proceed when the identified risk and concern have been addressed and rectified.

Environmental management during Construction of the Project will be integrated under the direction of the EM. Pertaining to this CEMP specific personnel will have defined responsibilities defined below.

The Construction Manager will be responsible for:

- Overall ownership of the CEMP; and
- Participation in Project meetings.

The EM will be responsible for:

- Implementation of compensation and offsetting programs;
- Coordination of the monitoring program in association with the Environmental Monitor or relevant qualified registered professional;
- Plan revisions; and
- External reporting.

The Environmental Monitor will be responsible for:

- Review and/or establishment of no-work boundaries around any sensitive areas in the proximity of construction activities in advance of the start of work;
- Inspect the work for compliance with the CEMP and relevant federal/provincial environmental regulations or Project-specific permit conditions;
- Participation in Project meetings; and
- Internal reporting.
- The EPCM Contractor will be responsible for:
- All aspects of the work which have the potential to impact the environment;
- Adherence to relevant federal/provincial legislation and Project-specific permit conditions as they pertain to the scope of work;
- Implementation of all construction mitigation/management measures unless otherwise noted;
- Fuel management and spill response; and
- Participation in Project meetings and reporting.

Pursuant to Condition 19 of the EAC #M19-01, BW Gold has established an Environmental Monitoring Committee to facilitate information sharing and provide advice on the development and operation of the Project, and the implementation of EAC conditions, in a coordinated and collaborative manner. Committee members include representatives of the BC EAO, UFN, LDN, NWFN, StFN, SFN, NFN, BC EMLI, BC ENV, and BC MOF.

4.0 Compliance Obligations, Guidelines and Best Management Practices

4.1 Legislation and Regulations

Federal legislation applicable to the CEMP includes:

- *Canadian Environmental Protection Act*, 1999
  - *On-road Vehicle and Engine Emission Regulations*
  - *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*
- *Explosives Act*
  - *Explosives Regulation*
- *Fisheries Act*
  - *Authorizations Concerning Fish and Fish Habitat Regulations*
- *Impact Assessment Act*
- *Migratory Birds Convention Act*, 1994
- *Seeds Act*
- *Species at Risk Act*
- *Transportation of Dangerous Goods Act*
  - *Transportation of Dangerous Goods Regulations*
- *United Nations Declaration on the Rights of Indigenous Peoples Act*

Provincial legislation applicable to the CEMP includes:

- *Building Act*
  - *British Columbia Building Code Regulation*
  - *British Columbia Fire Code Regulation*
  - *Building Act General Regulation*
- *Declaration on the Rights of Indigenous Peoples Act*
- *Environmental Assessment Act*
- *Environmental Management Act*
  - *Contaminated Sites Regulation*
  - *Hazardous Waste Regulation*
  - *Open burning Smoke Control Regulation*
  - *Petroleum Storage and Distribution Facilities Storm Water Regulation*
  - *Spill Reporting Regulation*
  - *Spill Preparedness Response and Recovery Regulation*
  - *Waste Discharge Regulation*
- *Forest Act*

- *Forest and Range Practices Act*
  - *Forest Planning and Practices Regulation*
  - *Invasive Plants Regulation*
- *Forest Practices Code of British Columbia Act*
- *Heritage Conservation Act*
- *Integrated Pest Management Act*
  - *Integrated Pest Management Regulation*
- *Mines Act*
  - *Health, Safety and Reclamation Code for Mines in British Columbia* (Code; EMLI 2021)
- *Transport of Dangerous Goods Act*
  - *Transport of Dangerous Goods Regulations*
- *Water Sustainability Act*
- *Weed Control Act*
  - *Weed Control Regulation*
- *Wildfire Act*
  - *Wildfire Regulation*
  - *Wildlife Act Permit Regulation, BC Reg.253/2000*
- *Workers Compensation Act*
  - *Occupational Health and Safety Regulation*

4.2 Environmental Assessment Certificate (EAC) and Federal Decision Statement (DS) Conditions

The CEMP addresses EAC Condition 13 and DS conditions 3.1 and 3.2. Concordance tables identifying where the requirements in EAC Condition 13 and DS conditions 3.1 and 3.1 are addressed, are provided in Appendix A and Appendix B, respectively.

4.3 Existing Permits

BW Gold received *Mines Act* Permit M-246 on June 22, 2021, authorizing early construction works (Early Works) within a permitted area encompassing 1, 018.9 hectares, *Environmental Management Act* Authorization 110662 authorizing discharges associated with the Early Works and Special Use Permit SP0001 authorizing construction of the MAR. On Mar 8 2023, BW Gold received Mines Act M-246 permit and on May 3, 2023 received *Environmental Management Act* Authorizations 110652 and 110650 for the Major Works scope. The requirements in this CEMP will augment and in some instances may supersede mitigation measures presented in the Early Works CEMP.

4.4 Guidelines and Best Management Practices

Guidelines and best management practices that have informed the development of the CEMP include:

- Developing a Construction Environmental Management Plan for Mines in British Columbia (BC MEMPR 2019);
- Riparian Management Area Guidebook (BC MOF1995);
- Forested Wetlands-Functions, Benefits, and the Use of Best Management Practices (Welsch et al. 1995);
- Archaeological Impact Assessment Guidelines (BC Ministry of Small Business, Tourism and Culture Archaeology Branch 1998);
- Guidelines for Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia (Price and Errington 1998);
- Policy for Metal Leaching and Acid Rock Drainage in British Columbia (BC MEM and BC MELP 1998);
- Traffic Control Manual for Work on Roadways (BC MOT 1999);
- Engineering Section Report: Construction Noise (WCB 2000);
- A Field Guide to Fuel Handling, Transportation, and Storage (BC MWLAP 2002);
- Invasive Plant Prevention Guidelines (Clark 2003);
- British Columbia Field Sampling Manual (BC MWLAP 2003);
- Terms and Conditions for Changes in and about a Stream Specific by MOE Habitat Officers, Omineca Region (BC FLNRO 2004);
- BC Hazardous Waste Legislation Guide (BC MOE 2005a);
- Best Management Practices for Raptor Conservation during Urban and Rural Land Development in British Columbia (BC MOE 2005b);
- Handbook for Pesticide Applicators and Dispensers (BC MOE 2005c);
- Wetland Ways: Interim Guidelines for Wetland Protection and Conservation in British Columbia (Cox and Cullington 2009);
- Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials (Price 2009);
- Invasive Alien Plant Program: Reference Guide (BC MOFR 2010a);
- Invasive Plant Chemical and Mechanical Treatment Record (BC MOFR 2010b);
- Pest Management Plan for Invasive Alien Plants on Provincial Crown Lands in Central and Northern British Columbia (BC MOFR 2010c);
- CCME Environmental Quality Guidelines for the Protection of Aquatic Life (CCME 2011);
- Fish-stream Crossing Guidebook BC (FLNRO 2012);
- Environmental Code of Practice for Metal Mines (EC 2012a);
- BC Ambient Air Quality Objectives and Standards (BC MOE 2013);
- Best Practices for Preventing the Spread of Invasive Plants During Forest Management Activities: a Pocket Guide for British Columbia's Forest Workers, 2013 Edition (BC FLNRO and ISCBC 2013);
- A Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia (BC FLNRO 2014);

- Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia (Government of British Columbia 2014);
- Develop With Care, Environmental Guidelines for Urban and Rural Land Development in British Columbia (BC MOE 2014a);
- BC Water Quality Guidelines (BC MOE 2014b);
- Management Plan for the Western Toad (*Anaxyrus boreas*) in British Columbia (BC MOE 2014c);
- Best Management Practices for Amphibian and Reptile Salvages in British Columbia (BC FLNRO 2016);
- Best Management Practices for Bats in BC (Holroyd and Craig 2016);
- Cariboo Chilcotin Coast Invasive Plant Committee Regional Strategic Plan. Version 3.1 (CCCIPC 2017);
- Fossil Management Framework (BC Fossil Management Office 2017);
- Best Practices for Managing Invasive Plants Along Roadsides: A Pocket Guide for British Columbia's Maintenance Contractors (ISCBC 2019);
- Fish and Fish Habitat Protection Policy Statement (DFO 2019a);
- Measures to Protect Fish and Fish Habitat (DFO 2019b);
- Guidelines to Reduce Risk to Migratory Birds (EC 2019);
- Interim Code of Practice: Temporary Stream Crossings (DFO 2020);
- Invasive Plant Pest Management Plan for Provincial Public (Crown) Lands in the Southern Interior of British Columbia (BC FLNRORD 2020);
- Interim Code of Practice: End-of-Pipe Fish Protection Screens for Small Water Intakes in Freshwater (DFO 2021); and
- Field Guide to Noxious Weeds and Other Selected Invasive Plants of British Columbia, 12th Edition (ISCBC 2021).

4.5 Compensation and Offsetting Programs

In accordance with the federal DS and EAC Certificate issued for the Project, compensation/offsetting plans have been prepared to mitigate Project impacts to fish and fish habitat (DS Condition 3.11), wetlands (DS Condition 5.3 and EAC Condition 24) and southern mountain caribou (DS Condition 8.18 and EAC Condition 22). Bat habitat compensation is also proposed.

While development and implementation of these compensation programs (as distinct Project-level mitigation measures) are largely outside of the scope of this CEMP, they are included here because they are a key component of offsetting project impacts (i.e., mitigations). Summaries of the compensation plans are provided below.

4.5.1 Fish and Fish Habitat

The Project has acquired an Authorization under section 35(2)(b) of the *Fisheries Act*, and a Schedule 2 amendment of the Metal and Diamond Mining Effluent Regulations (under section 36 of the *Fisheries Act*). The Blackwater Fish Habitat Offsetting Plan (Palmer 2023a) and Fish Compensation Plan (Palmer 2023b) have been developed to meet the requirements of these authorizations.

The Blackwater Fish Habitat Offsetting Plan includes the following measures:

- Channel restoration and enhancement of fish habitat at Murray Creek and Greer Creek. Construction of two off-channel ponds to help address the availability of overwintering habitat as a limiting factor for rainbow trout abundance in the study area, including at Creek 661 Upper Pond. The Freshwater Reservoir (FWR) will function to augment flows in Davidson Creek downstream of the Project, and thereby offset the loss of habitat in Davidson Creek that would otherwise occur from development of the Project in the upper catchment and subsequent reduction in catchment area. Creation of a connector channel between Lake 16 (the headwater lake of Davidson Creek) and Lake 15 (to the west of Lake 16) to offset the loss of fish habitat in upper Davidson Creek, and provide additional habitat for the rainbow trout population in Lake 16 which would otherwise become isolated.

The Blackwater Fish Compensation Plan includes the following measures:

- Mathews Creek channel restoration/enhancement; and
- Mathews Creek off-channel pond creation.

4.5.2 Wetlands

EAC Condition 24 and DS Condition 5.3 require BW Gold to develop a Wetlands Management and Offsetting Plan prior to construction, in consultation with Indigenous groups, FLNRORD and Environment and Climate Change Canada (ECCC). The Wetlands Management and Offsetting Plan is intended to offset the Project's impacts on wetland functions during the Construction, Operations, and Closure phases. The development of the plan must take into account Canada's Federal Policy on Wetland Conservation (Environment Canada 1991), Canada's Operational Framework for Use of Conservation Allowances (Environment Canada 2012b), and habitat needs for migratory birds, moose and listed species at risk.

BW Gold initiated pre-construction wetland surveys within the Certified Project Description (CPD) boundary (with the exception of the transmission line which was surveyed in 2017) during the summer and fall of 2021 to fulfill DS Condition 5.5.1. Further field studies were completed in 2022 to finish pre-construction surveys and identify additional offsetting sites.

Currently the Mathews Creek and Dykam Ranch wetland complexes are the primary wetland offsetting sites.

4.5.3 Caribou

The mine site overlaps the eastern boundary of the Tweedsmuir local population unit (LPU) of mountain caribou (*Rangifer tarandus caribou*). The LPU is listed as threatened under Schedule 1 of the *Species at Risk Act*, a special concern by Committee on the Status of Endangered Wildlife in Canada, and blue-listed by the province.

BW Gold has developed a Caribou Mitigation and Monitoring Plan (CMMP) to avoid, reduce, and offset the Project's adverse effects on caribou and its critical habitat. The Project overlaps with Matrix 1 caribou habitat, however, the habitat is rarely used by caribou, likely due to forestry disturbance restricting caribou access to Mount Davidson. BW Gold recognizes that the Project will have a residual effect on caribou habitat in the Tweedsmuir LPU and concerns that underscore recent declines, primarily associated with natural disturbances and forestry across the Tweedsmuir LPU. As a result, BW Gold is taking a conservative approach and proposing a habitat securement-based offsetting plan for caribou habitat as well as non-habitat measures as described in the August 12, 2021 CMMP.

BW Gold has committed to the following offsets:

- The BW Gold mineral tenures in the Capoose HE-UWR (an area of approximately 11,059 ha) will be secured against future development for a period of 50 years as described in Section 4.2.4. This will account for the offset area associated with all 248 ha of impacted HEWR and 1,446 ha of impacted Matrix 1.
- The remaining 3,022 ha of impacted Matrix 1 will be offset through restoration of forestry roads, assuming half in LEWR and half in Matrix 1.
- The total area to be restored is 27,100 ha (271 km^2).
- Assuming a 1.25 multiplier to account for road overlap, 338 km of road at a cost of $8,000 per km equals an estimated cost of $2,707,614.
- UFN and LDN will lead the implementation of the offsetting program on the ground.

4.5.4 Bats

Pre-construction surveys were conducted during summer 2021 to identify potential roosting habitats (e.g., snags and wildlife trees) and bat recorders were used to identify whether sites were occupied. Following DS 8.15, and recommendations from ECCC, BW Gold will implement mitigation to avoid effects on bat habitat and restore habitat, following the mitigation hierarchy:

- Retain trees or stands that may support bat roosts;
- Retain key bat habitat resources where possible;
- Restore disturbed habitat - restoration will be addressed through the Reclamation and Closure Plan;
- Augment habitat;
- Where protected and/or restoration habitat areas for other wildlife (e.g., caribou, migratory birds, western toads) have been identified as offsets, implement measures beneficial to bats within these areas (e.g., Capoose HE-UWR, caribou and wetland restoration areas); and
- Install roosting structures and study their effectiveness.

In both their February 28, 2022 letter and a subsequent letter on May 2, 2022, ECCC and representatives from LDN and UFN indicated that they preferred the use of Brandenbark as a roosting structure and did not support the use of bat boxes. Therefore, roosting structures (Brandenbark) will be installed in the vicinity of lost roosting habitat.

Augmenting habitat for bats will be conducted by restoring wetland habitat that provide the majority of the insect food for bats, through wetland offsetting in the Wetland Mitigation and Offsetting Plan (WMOP) and removal of forestry roads as part of caribou offsetting in the CMMP. Removal of roads will re-connect streams and repair hydrologic connections, therefore augmenting wetlands.

A follow-up monitoring program for little brown myotis and northern myotis will be implemented during construction, operations, and closure to comply with DS Condition 8.22 and to address EAC Condition 23h (requirement of a subcomponent plan for bats) and recommendations from ECCC made on February 28, 2022.

5.0 Adaptive Management Framework

The CEMP is a living document that will evolve during the Construction phase in response to monitoring results. The CEMP incorporates adaptive management as follows:

- **Plan**
  - Identify compliance obligations;
  - Identify pre-construction requirements (e.g. pre-clearing surveys) through application of appropriate and applicable risk windows for fish, wildlife, birds, etc.;
  - Provide a framework for environmental risk management;
  - Provide a spill response framework and equipment inventory;
  - Establish records database; and
  - Prepare monitoring schedules.
- **Do**
  - Conduct pre-construction and pre-clearing surveys subject to timing windows;
  - Develop site orientation and training procedures; and
  - Identify record keeping procedures and logs.
- **Monitor**
  - Conduct monitoring;
  - Complete and maintain monitoring records; and
  - Report on findings or incidents.
- **Adjust**
  - Review effectiveness of mitigation measures;
  - Identify new and/or alter mitigation measures based on review of plan measures and incorporate into monitoring program and reporting; and
  - Revise the CEMP as new and/or altered measures are introduced.

6.0 Construction Schedule

A preliminary Project construction schedule is presented in Table 6-1 which includes site preparation and construction activities. Construction will take approximately 18 to 24 months. Early Works construction activities on the mine site are authorized by *Mines Act* Permit M-246 and Special Use Permit SP0001.

The EPCM Contractors will oversee the delivery of certain specific aspects of the construction and will be managed by BW Gold with oversight from both in-house and external qualified registered professionals. Workforce scheduling will be closely coordinated between BW Gold mine personnel and the EPCM Contractors.

Table 6-1: Preliminary Project Construction Schedule

Year	Activities Proposed as Approved or Pending Approval by Permit/Authorization or Other Requirement (e.g., EAC plan approval)
Early Works (Authorized by *Mines Act* Permit M 246 and *Environmental Management Act* Permit 110602)	• Clear, grub and construct mine site roads. • Clear mine access borrow area and Southern Site C borrow area. • Clear TSF Site C starter dam footprint and borrow and preparation area. • Clear FWR footprint. • Clear the Low Grade Ore Stockpile footprint. • Clear Open Pit (20.6 ha of new disturbance). • Clear Upper Waste Stockpile site. • Clear explosives storage, truck shop, operations camp, and ready line and bulk fuel storage. • Clear, grub and construct plant site pad. • Clear, grub and construct the Mine Access Road (approximately 8 km located on the mine site). • Construct bridges for MAR and mine site roads
Year -2 & Year -1 (Authorized by *Mines Act* Permit M-246 and *Environmental Management Act* Authorizations 110652/110650)	• Clear and grub the footprints of all major mine components (pit, roads, stockpile base, TSF C starter dam, FWR, process plant, crushers). • Prepare for and commence infrastructure construction. • Strip sites for the waste and topsoil stockpiles. • Construct water diversion, Water Management Pond, and management structures. • Main Dam C – Excavation of cut-off-trench and initial fill placement (Year -2) followed by Main Dam C Stage 1 construction to 1,273 meters above sea level (masl). • TSF C Pond – Starter pond initiation at the diversion berm. • Construct mine site roads and haul road from the pit to the stockpiles, crusher, and tailings dam. • Establish construction camp, operations camp, and services. • Establish explosives storage facility. • Excavate construction borrow pit mined down to 1,510 masl bench and starter pit down to 1,610 masl bench. • Deliver construction rock to the process area for use in the conveyor pads and to Site C Dam. • Stockpile Low Grade Ore beginning in Year -1 on the ROM pad for use in mill commissioning. • Construct the Metals Water Treatment Plant (WTP). • Construct processing plant infrastructure - foundations, buildings, services. • Construct the transmission line, mine site substation, and electrical distribution system.

Year	Activities Proposed as Approved or Pending Approval by Permit/Authorization or Other Requirement (e.g., EAC plan approval)
	• Energize site with electrical power from grid connection. • Install site security, communications, first aid and emergency response facilities. • Decommissioning of Exploration Access Road.

7.0 Environmental Constraint Mapping

Preliminary environmental constraint mapping for the mine site is presented in Figures 7-1 and 7-2 at 1:25,000 for the following values:

- Whitebark pine habitat;
- High elevation ungulate winter range;
- Old growth forest;
- Wetlands;
- Watercourses (with fish-frequented status);
- Protected riparian areas; and
- Known archaeological and cultural heritage resource sites (within 150 m of facility footprint).

The mapping reflects the mine site footprint as of the end of the Construction phase. The environmental constraints mapping will be updated to incorporate 2021 and 2022 baseline surveys, when available. This mapping will inform construction planning activities, site specific CEMPs, tailgate meetings, and any seasonal work constraints.

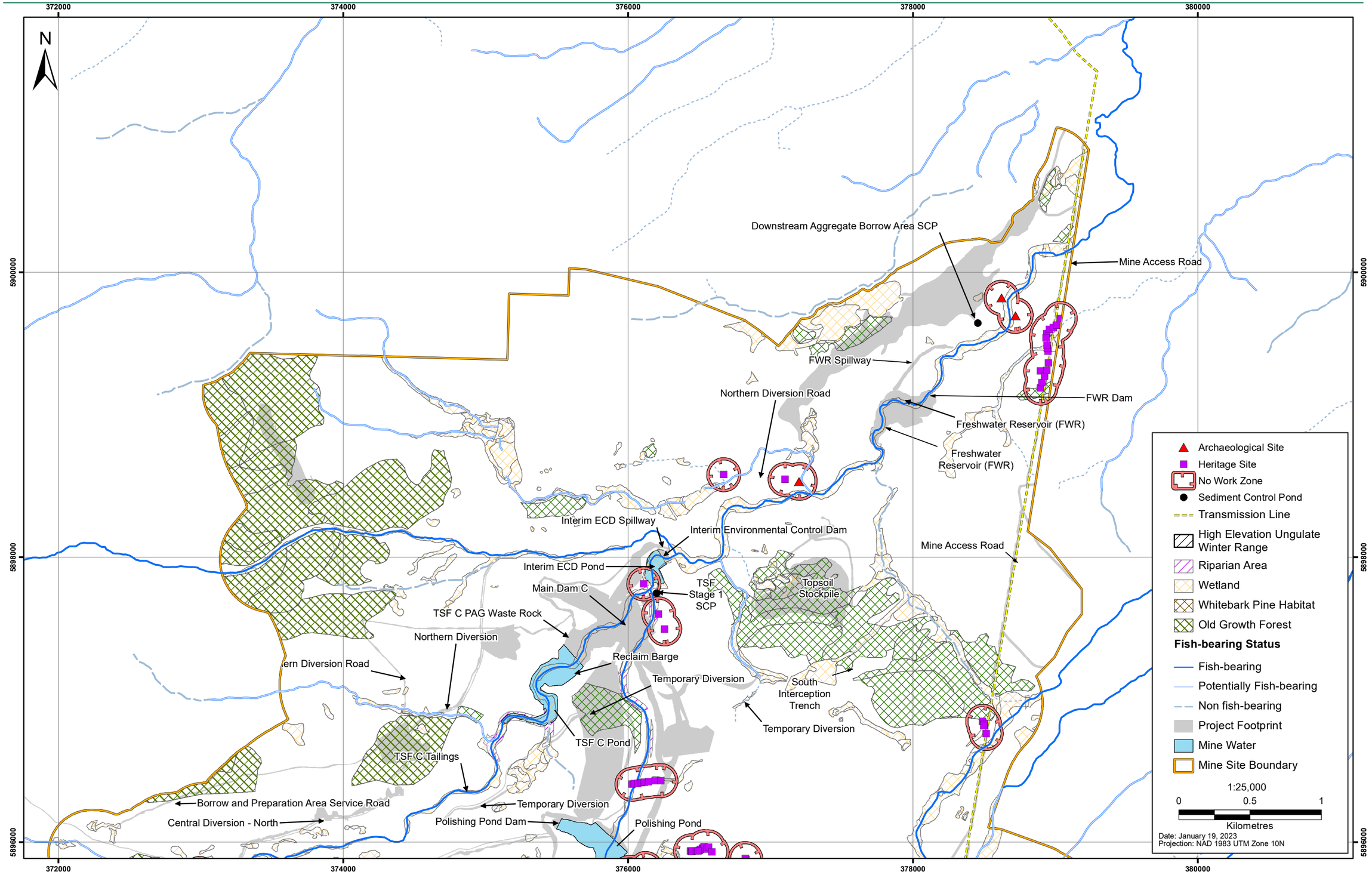

Figure 7-1: Environmental Constraints within Mine Site Certified Project Description Boundary (1 of 2)

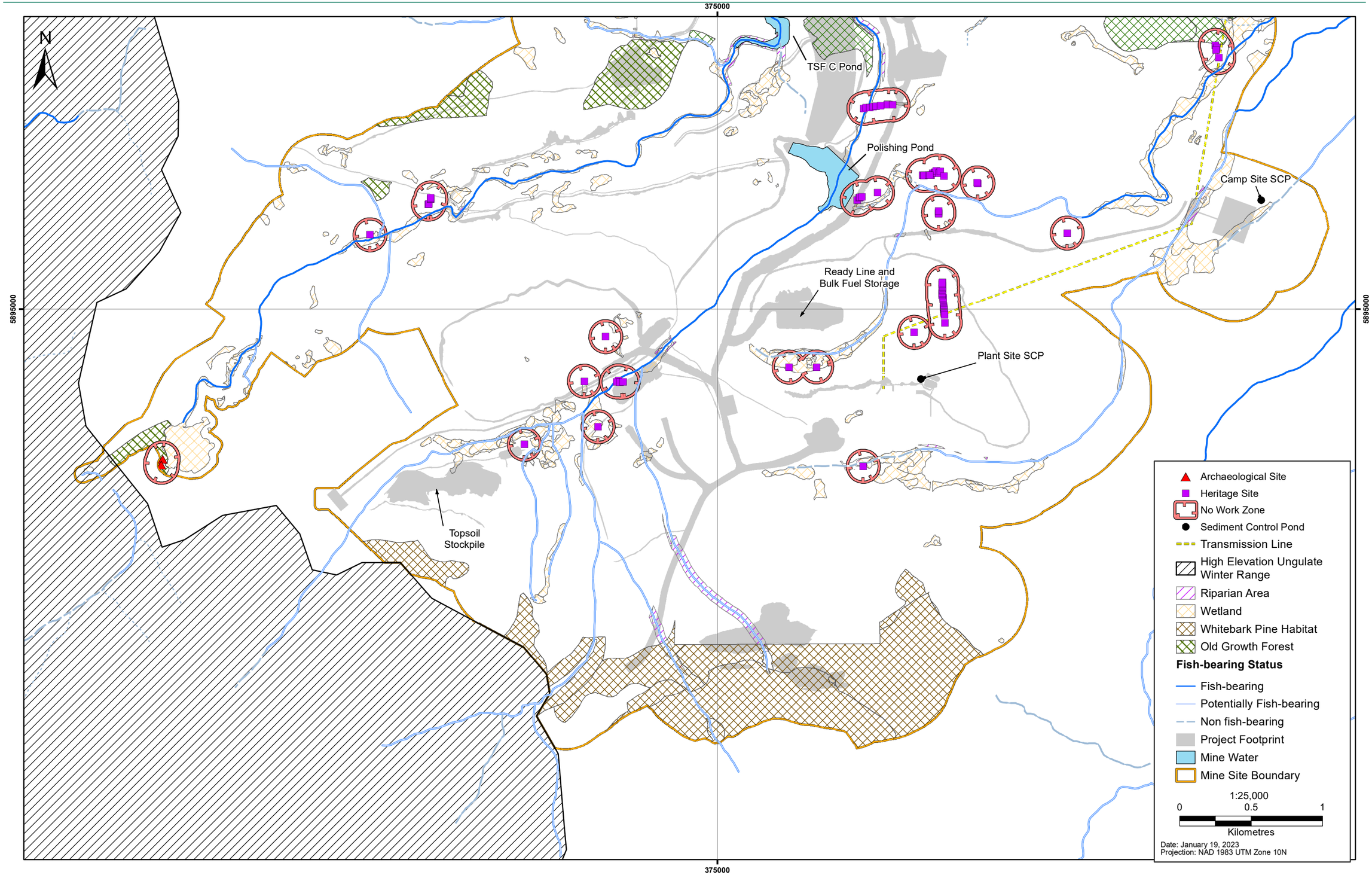

Figure 7-2: Environmental Constraints within Mine Site Certified Project Description Boundary (2 of 2)

8.0 Risk Management

Environmental risk is managed by applying reduced risk or timing windows for fish and wildlife species, wherever possible. These windows often overlap throughout most of a calendar year when multiple fish and wildlife species are considered. Therefore, BW Gold proposes to use a risk-based approach in the event that Project activities outside of least risk windows is necessary, subject to regulatory requirements and the implementation of additional mitigation measures.

With respect to known heritage resource values, the *Heritage Conservation Act* provides automatic protection for artifacts, features, materials or other physical evidence of human habitation or use on or before 1846 as well as petroglyphs, petroforms, heritage wrecks, and burials regardless of age. Given the protection provided by the *Heritage Conservation Act*, these values are not considered in the risk management approach described below. The Archaeological and Cultural Heritage Resource Management Plan (Appendix 9-I) describe measures to mitigate impacts on known and unknown archaeological and cultural heritage resources.

Table 8-1 provides an example decision hierarchy ranking that BW Gold will implement to guide construction planning and the mitigation measures that will be implemented. This ranking is based on relative strength of legislation and guidance (for instance, the *Fisheries Act* is stronger legislation than the *Migratory Bird Convention Act*) and cultural values. In the hierarchy, a valued component with a ranking of “1” would take precedent over a valued component with a ranking of ‘2’ or ‘3’, for which mitigation measures would be implemented to limit the effect.

Table 8-1: Risk Management Ratings

Value	Decision Hierarchy	Example Mitigation Approach
Fish and Fish Habitat	1	• Avoidance measures • Adhere to timing windows • Follow Department of Fisheries and Oceans (DFO) mitigation procedures • Fish salvage
Species at Risk (e.g., caribou)	2	• Avoidance measures in high elevation winter and summer range, matrix habitat • Monitor and temporarily stop-work when caribou observed
Breeding Birds	3	• Conduct pre-construction surveys if work planned between April 15 and August 31 • No work zones for occupied nests
Seasonal Habitat for Important/Sensitive Wildlife	4	• Avoidance measures • Pre-construction surveys
Red-listed Ecosystems/Wetlands	5	• Avoidance measures • Pre-construction surveys

If there is a conflict between two environmental values, the EM will apply the mitigation hierarchy to decide which value will be prioritized and identify the mitigation measure(s) that will be applied to reduce the risk to the lowest ranked environmental value possible, if necessary. Relevant qualified registered professionals will be consulted in the event that the decision hierarchy process is used, where there is a credible risk of impacts to the environment as determined by site environmental staff and Aboriginal Groups will be notified or otherwise consulted. Additional qualified registered professionals such as the Environmental Monitor and federal or provincial government agencies may also be consulted.

9.0 Mitigation and Management Measures

This section identifies measures that will be implemented during the Construction phase to mitigate the Project's environmental effects. Relevant management plans are referenced in each section.

Prior to the start of construction related activities the CM, Environmental Monitor, and the EPCM Contractor(s) will meet onsite and review site-specific environmental and safety requirements and areas of potential concern (see Section 14.1 for further details).

9.1 General Measures

Table 9.1-1 presents general mitigation measures and best management practices that will be implemented to mitigate environmental impacts and help keep employees and contractors safe during construction.

Table 9.1-1: General Mitigation and Management Measures

Category	Mitigation/Management Measure
Site Tidiness	Keep work areas clean, tidy, organized and left in good condition.
	Construction material will not be stockpiled within a Riparian Management Area (RMA), in accordance with the Riparian Area Standard Operating Procedure.
	Remove construction debris and unused material from the work area upon completion of work to designated areas in accordance with the WMP (Section 8.1.1).
Waste Management	Promote workplace cleanliness through on-boarding training by reinforcing the expectation to keep areas free of uncontained refuse and placing litter, including cigarette butts, into appropriate waste containers.
	Locate and secure portable sanitary facilities at minimum 15 m from the top bank of a watercourse.
	Dispose of authorized putrescible refuse (i.e., camp waste, paper, cardboard, and lumber scraps) in a diesel-fired incinerator as per *Environmental Management Act* Permit 106530 or as otherwise permitted.
	Collect and dispose of recyclable material offsite (WMP, Sections 7.1 Recycling Policy and 7.3 Waste Transfer Areas).
	Store domestic non-hazardous wastes (i.e., food, food-covered packaging, and other non-recyclables) in sealed, wildlife-resistant containers for disposal (WMP, Sections 7.1 Recycling Policy, 8.1.2 Domestic Waste and Section 7.3 Waste Transfer Areas).
	Store non-combustible industrial waste in designated areas for recycling or disposal of off-site (WMP, Section 7.1 Recycling Policy and Section 8.1.1 Industrial Waste)
	Collect and dispose of hazardous waste offsite in accordance with the CMSTHP (Section 8.4 Transfer Offsite).
Traffic and Site Access	Restrict site access to authorized personnel in accordance with the MSTCP (Section 7.4 Access Control and Security).
	Require the use of busses to transport non-management workers to the mine site along the Kluskus and Kluskus-Ootsa FSRs.

Category	Mitigation/Management Measure
Traffic and Site Access *(cont'd)*	Provide authorized personnel with road use training in accordance with Section 6.1 of the MSTCP.
	Project vehicles will be restricted to designated roads and trails. Signage will be used on all roads to indicate access and road restrictions will be a part of training. Private vehicle access will be limited to authorized personnel only. If personal vehicles are used for site access, they will be prohibited from use on mine site roads.
	Use radios for road and traffic control (MSTCP, Table 7.6-1 Traffic and Vehicle Management Protocols).
	Prior to road commissioning install signage as determined by the engineering design report (Allnorth 2013; MSTCP, Table 7.6-1 Traffic and Vehicle Management Protocols).
	Complete formal reporting for all environmental incidents (including human-wildlife interactions where there is active deterrence and direct harm, injury, damage, or wildlife mortality occurs). The report will document the following: • A summary of the event, response action, and means of implementation; • Copies of internal and external communications; and • Follow up monitoring results, and any adaptive management outcomes. (WMMP, Section 5.1.1 Incident Response Records; CEMP Section 9.1 Reporting)
	Apply water (preferred) to control dust on Project roads during dry periods (less than 0.25 mm/day of precipitation in the previous week and temperatures are above freezing) in accordance with Section 5 of the Fugitive Dust Management Standard Operating Procedure (AQDMP Appendix D). Chemical dust suppressant (e.g., calcium chloride) shall only be used on roadways following approval from the Mine Manager or their designate.
Orientation and Training	Hold daily tailgate meetings in accordance with Section 8.4.4 of the Occupational Health and Safety Program.
	Provide site personnel with orientation that is appropriate for their roles and responsibilities. Orientation topics will include but are not limited to: • Access road use and haulage operating protocols; • No hunting / no fishing / no gathering policy; • Wildlife observation and interaction reporting procedures; • Caribou awareness program; • Bear awareness program; • Whitebark pine awareness and identification; • Waste management procedures; • Wildlife-human interaction procedures, including management of wildlife attractants; • Wildlife sensitive locations/timing as applicable; • Hazardous material management; • Onsite waste procedures; • Erosion prevention and sediment control; • Best management practices for working in environmentally sensitive areas; • Archaeological and Cultural Heritage Chance Find Procedure; and • Emergency procedures including spill response and incident reporting.

Category	Mitigation/Management Measure
Equipment Use	Maintain equipment in good working condition as determined by the manufacturer's recommendations. Lock and tag out equipment for servicing, repairs, tests or general maintenance. Remove unserviceable equipment from use.
	Develop maintenance and operations procedures designed to keep machinery clean and free of excess oil and grease, and leak-free.
	Operate equipment as determined by the manufacturer specifications and capacities (i.e., do not overload machines).
	Equipment will not idle, unless operational requirements and ambient temperatures require engines to continue running (e.g., extreme cold conditions where there is a risk the machine may not restart) or if the equipment or vehicle is being used for refuge (e.g. warming or cooling and lunch breaks).
	Select equipment with industry standard noise abatement technology, including exhaust, and compressor/fan noise.
	Mobile equipment should arrive on site clean and free of all material, debris, and vegetation, or be cleaned in a designated location prior to unloading (IPMP, Section 8.2.1).
	Maintain spill response kits on mobile equipment and at active drill and water supply pump sites. Generators, pumps, and pump fuel supplies shall use absorbent mats and containment devices to contain spills (FMSCP, Section 10.3).
	Prohibit use of hand-held cellular communication devices (i.e., smartphones) while operating all vehicles, mobile equipment, and machinery.
Geological and Terrain Hazards	Visually assess cleared areas and cut/fill slopes after significant precipitation events (*24-hr storm events > 44 mm rain precipitation 2-Year return period)* for signs of instability or erosion in areas of terrain class 4 or 5.
Adverse Weather Shutdown	The Site Supervisor will check the weather forecast daily, and current weather conditions if applicable, to anticipate the need for adverse weather shutdown (i.e., extreme high or low temperatures, strong winds, high rainfall or snowfall, lightning) depending on activities.
	Establish clear lines of communication to facilitate shutdown in adverse weather conditions.
	Shutdown soil salvage activities during periods of ongoing or recent heavy rain (greater than 73 mm/day), or high winds (typically > 30 km/h) (SMP, Table 9.1-3).

Notes:

CMSTHP = Chemicals and Materials Storage, Transfer and Handling Plan [incl. Cyanide Management Plan]; FMSCP = Fuel Management and Spill Control Plan; IPMP = Invasive Plant Management Plan; MSTCP = Mine Site Traffic Control Plan; SMP = Soil Management Plan; WMP = Waste (Refuse and Emissions) Management Plan, WMMP = Wildlife Mitigation and Monitoring Plan

9.2 Site-specific Erosion and Sediment Control

The SEPSCP has been developed to provide the erosion and sediment control framework that will be implemented during all Project phases, including Construction. The SEPSCP provides the overall approach

BW Gold will take; the erosion potential will be calculated for disturbance areas and included on the Issued for Construction (IFC) drawings. The soil erosion class will be calculated using potential for soil loss, IFC drawings, and site specific conditions and will be used to guide the selection of appropriate erosion control measures. Areas identified as having greater potential impact on the environment will require more intensive Erosion and Sediment Control (ESC) measures and monitoring. The EM will monitor the status of erosion and sediment control measures and report on any increased risk at specific sites to the Mine Manager. Erosion and Sediment Control measures will be field-fit by the EPCM Contractor based on conditions encountered in the field and under the direction of the Environmental Monitor.

9.3 Drainage Control and Water Management

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Mine Site Water and Discharge Management Plan; and
- Surface Erosion Prevention and Sediment Control Plan.

9.3.1 Sediment Control Ponds

Water management during Project construction will be in accordance with the MSDP. Surface runoff from plant site grading, open pit development, TSF construction and waste rock storage area development will be directed to the TSF basin or other designed sediment control structures. Four sediment control ponds (SCP) will be constructed during construction to capture and manage surface water runoff; these are key pieces of water management infrastructure during this phase while infrastructure is constructed and commissioned. The sediment control ponds incorporate perimeter ditching to capture local runoff and direct it to the pond. Final drainage control across the mine site will be in accordance with IFC site plans and specifications.

Mitigation responses will be implemented if water flow, water quality or toxicity does not meet required proposed targets for the TSF Stage 1 SCP discharge (MSDP, Table 8.2 2), Camp Site and Plant Site SCP discharge (MSDP, Table 8.2.3), and Downstream Aggregate Borrow Area SCP discharge (MSDP, Table 8.2-4). At each of the SCPs discharge quantity and quality will be monitored to assess if the proposed targets have been met. Surface discharge rates from the TSF Stage 1 SCP, Plant Site SCP, Camp Site SCP, and Downstream Aggregate Borrow Area SCP will be monitored continuously during periods of surface discharge (Section 8.3.1.2 of the MSDP). Discharge quality will be assessed on a weekly, monthly, or bi-annual frequency consistent with discharge permit and regulatory requirements (Section 8.3.2 and Table 8.3-1 in the MSDP). If measured concentrations exceed SCP targets identified in Tables 8.2-2 to 8.2-4 of the MSDP, the initial response will trigger immediate confirmatory or supplemental sampling and an investigation to identify the cause. BW Gold will engage suitably qualified individuals to supervise the construction activities, where deemed necessary, who will determine the validity of a result and whether it results from construction or other external factors. This will be conducted in parallel with the implementation of mine site water management options to minimize the quantity of nonconforming water discharged to the environment until the water is shown to be suitable for discharge. A qualified registered professional will determine the appropriate mitigation measures or Best Management Practice (BMP), which may include (see MSDP, Table 10-1):

- Implementing additional sediment transport and erosion controls (see Section 7.3.1 of the SEPSCP);
- Implementing localized pH-adjustment and/or flocculant or other settling aids (if required; see Section 7.3.1.3 of the SEPSCP) through third party contract support;
- Treating the Camp Site SCP water at the metals WTP (to operate beginning in Year -1); and

- Routing water to a contact water management pond (e.g., water management pond, supernatant ponds in the TSF) for temporary containment.

Monitoring the effectiveness of mitigations will be at frequencies dependent on site conditions and the requirement for additional mitigations (i.e., an increase in contaminant concentrations in construction runoff in the receiving environment may require increased monitoring frequency, additional monitoring stations in the receiving waterbody both upstream (background) and downstream of the SCP). In addition, depending on the site of the exceedance, the nature of the construction work, and the magnitude and duration of the exceedance, stop work orders may be issued if on-going exceedances are not rectified in a timely manner.

The potential need for and use of flocculant, or other BMPs associated with erosion prevention and sediment control, will follow methods described in Section 7.3.1.3 of the SEPSCP (see also Section 15.6.1). As defined in the SEPSCP, total suspended solids and turbidity will be monitored to assess the effectiveness of erosion prevention and sediment control. Targets for construction runoff as well as corrective measures applicable to erosion and sediment control to be implemented in a timely manner are defined in Table 15.6-1.

9.3.2 Mine Water Management

Construction of the TSF will commence in Year -2 with the diversion of Davidson Creek and construction of the TSF C Diversion Berm, TSF C Stage 1 SCP, and the Interim Environmental Control Dam (IECD) and pond. During Construction, site contact and non-contact water will be collected and stored within the TSF (supernatant pond, TSF C Pond) and/or the water management pond. Water stored within the TSF C Pond will be used to inundate the PAG/NAG3 waste rock to limit oxidation and subsequent acid generation and minimize metal leaching (see Section 9.6). The water supply sources to the TSF during Construction include:

- Runoff from within the TSF catchment and direct precipitation onto the TSF;
- Flows not collected and diverted by the Central Diversion System (see KP 2021c);
- Water pumped back from the IECD pond; and
- Overflow through the culverts and spillway from the water management pond.

The supernatant pond (TSF C Pond) is designed with a nominal supernatant pond volume up to approximately 2 Mm^3 with allowance for seasonal fluctuations of approximately 3 Mm^3 without impacting freeboard available for storage of the Environmental Design Flood (i.e., most severe flood that is to be managed without release of untreated water to the environment). Mine water stored in TSF C Pond is estimated to be 1 Mm^3 by Year -1.

The water management pond will be constructed in Year -2 downslope of the Open Pit and stockpiles area and within the ultimate footprint of TSF C to manage runoff from contributing areas. The water management pond will have a capacity of approximately 825,000 m^3. Sources of water to the water management pond during construction include:

- Precipitation on the pond;
- Non-contact runoff and groundwater discharge from the up-gradient catchment;
- Diverted (non-contact) flow from the Central Diversion;
- Effluent from the metals WTP in construction, which conveys treated flows from the pit dewatering system and the Lower Waste Stockpile;
- Effluent from the membrane WTP, once operational; and

- Seepage from the Lower Waste Stockpile.

Management of unplanned water release and water quality within the TSF C Pond and water management pond will be in accordance with the MSDP (Sections 7.2.2, 7.2.5, and 11.0).

9.4 Visual Resources

Potential impacts to visual resources as a result of construction activities are due to tree clearing, creation of new forest openings, temporary presence of heavy equipment and development of infrastructure, including transmission line towers and power lines, which alter and may degrade the viewshed in publicly-accessible areas. The Project's visual impacts have largely been mitigated by engineering design and infrastructure siting. Key design mitigation include:

- Developing site-specific measures and designs to screen views of structures and/or soften the effect of structures breaching natural ridgelines when viewed from identified vantage points;
- Locating facilities outside of viewsheds with publicly accessible vantage points, where technically feasible;
- Locating facilities near existing infrastructure to avoid additional surface disturbance;
- Following existing landscape contours to avoid interrupting natural landscape lines or edges;
- Minimizing contrast between areas impacted by the Project activities and facilities, and the surrounding natural environment; and
- Application of mitigation measures to minimize the effect of artificial light in accordance with Section 3.1 of the WMMP.

9.5 Noise and Vibration

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Noise and Vibration Effects Monitoring and Mitigation Plan.

Major noise and vibration sources during construction include heavy equipment movement and blasting. Smaller impact equipment material handling equipment (e.g., concrete trucks), and auxiliary equipment (e.g., pumps and generators) will also generate noise. Increases in helicopter flights and fixed wing aircraft to the airstrip will increase air traffic noise. Noise and vibration have the potential to impact land users, recreationalists, and fish and wildlife. During construction, noise and vibration will be managed in accordance with the NVEMP (EAC Condition 21). Measures (including best management practices) to mitigate potential noise and vibration impacts during construction are presented in Table 9.5-1 (NVEMP, Section 10.1).

Table 9.5-1: Noise and Vibration Mitigation and Management Measures

Category	Mitigation/Management Measure
Noise and Vibration	Machinery and equipment will be fitted with a properly maintained muffler or other noise reducing device, in accordance with Section 2.6.1 of the Health, Safety and Reclamation Code for Mines in British Columbia.
	Conduct blasting between 6 AM and 6 PM.

Category	Mitigation/Management Measure
	Employees involved in material handling or management will receive training by a qualified person on the importance of minimizing material drop height (from excavator to truck, conveyor to stockpile, etc.) to reduce fugitive dust, noise, and vibration.
	Perform monthly inspections of vehicles and equipment to ensure that noise abatement components (e.g., mufflers) are working as determined by manufacturer specifications. Complete manufacturers specified maintenance, and replace worn parts and apply lubricants, to meet manufacturers' noise output specifications.
	Select and use low-noise portable ground support equipment (e.g., power generators, pumps) whenever possible.
	Implement airstrip construction noise mitigation measures the same as those for the mine site.

9.6 Metal Leaching/Acid Rock Drainage

During construction, Metal Leaching / Acid Rock Drainage (ML/ARD) will be managed in accordance with the ML/ARDMP, which includes SOPs for construction and operations, including; waste rock and ore blast hole monitoring, waste rock and ore grade control monitoring, tailings monitoring, overburden monitoring, and verification monitoring. Of particular relevance to Project construction is the Overburden Monitoring SOP that includes procedures for overburden testing as well as frequency. This Overburden Monitoring SOP has been included as Appendix C for implementation during Construction.

The Project will produce five types of waste rock, differentiated by acid generating and metal leaching (ML) potential, in addition to tailings (not produced during construction Year -2 and Year -1), overburden and topsoil. Mine waste is classified based on whether it is predicted to be potentially acid generating (PAG) or non-acid generating (NAG) as shown by the calculated neutralization potential (NPR). The NAG waste rock is further classified using ML potential based on zinc concentration. Zinc is a parameter of interest for the Project (pyrite and sphalerite are correlated with mineralization) and its mobility was found to be correlated with its solid-phase content under neutral pH conditions (AMEC 2014). Selenium a parameter of interest, which was found to be elevated in 36% of the samples, has a systematically higher content in samples with zinc concentrations > 1,000 ppm, which is the basis for defining NAG3.The overall classification criteria are as follows: ore and tailings (PAG); low grade ore (PAG); waste/overburden (NAG); waste rock is divided into five classes for ML/ARD management purposes (Table 9.6-1).

Table 9.6-1: Waste Rock Segregation Criteria

Rock Type	NPR	Zinc (mg/kg)
PAG 1	≤1	n/a
PAG 2	1 - ≤2	n/a
NAG 3	> 2	≥ 1,000
NAG 4	> 2	600-1,000
NAG 5	> 2	< 600

Source: Section 4.2 ML/ARD Management Plan.

Note: NPR = Neutralization Potential Ratio, n/a = not applicable.

From Year -2 to Year -1, approximately 1.2 Mt of PAG (PAG1, PAG2) and potentially metal leaching non-acid generating (NAG3) waste rock will be mined and placed in the designated pre-production PAG disposal area at TSF C. The waste rock placement will be monitored in accordance with the Waste Rock and Ore Grade Control SOP to ensure it is not inadvertently re-directed to other construction sites. All PAG1, PAG2, and NAG3 waste rock will be stored under saturated conditions in the TSF. The expected exposure periods during construction (Year -1 and Year -2) are less than a month (see ML/ARD Management Plan, Table 6.1-1). Based on the results from the kinetic test program (AMEC 2014), it is expected that ARD may develop locally in PAG domains within the TSF basin before flooding is achieved. This scenario is accounted for in the source term and water quality model.

Waste rock classified as NAG3 will be used in construction of the TSF dams or otherwise stored in the TSF and submerged within five years of mining to reduce metal leaching.

Overburden across the mine site is largely expected to be NAG with low ML potential. The majority of the overburden will be used for the construction of TSF embankments. The volume of overburden requiring active management is expected to be minor and limited to zones near the bedrock contact in the vicinity of the ore deposit.

Waste rock material classified as NAG4 and NAG5 will be used in the construction of unsaturated and downstream portions of the TSF embankments. While the difference in zinc leaching potential between NAG4 and NAG5 is small to negligible (AMEC 2014), NAG5 will be used preferentially for construction (in accordance with ML/ARD Management Plan, Figure 6.1-1: Flow Chart Illustrating the Decision Sequence and ML/ARD Management Strategies that will be Employed for Waste Rock and Overburden). Excess NAG overburden as well as NAG4 and NAG5 waste rock that is not used for construction purposes will be deposited in waste stockpiles.

Infrastructure such as road alignments, construction pads, and laydown areas are part of the operational mine site layout and will be constructed with excess waste rock and/or borrow source material. To prevent ML/ARD release from construction sites that contain waste rock fill, only NAG4 and NAG5 material will be used for unsaturated construction locations across the mine site.

9.7 Soil Management

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Soil Management Plan;
- Air Quality and Fugitive Dust Management Plan; and
- Surface Erosion Prevention and Sediment Control Plan.

Broad-scale earthworks are required to construct Project facilities. Suitable soils will be salvaged and stockpiled for reclamation in accordance with the SMP.

Measures (including best management practices) to mitigate potential effects on soils are presented in Table 9.7-1.

Table 9.7-1: Soil Mitigation and Management Measures

Category	Mitigation/Management Measure
Soil Handling	Avoid salvage during dry (less than 0.25 mm/day of precipitation in the previous week) and/or windy (consistently greater than 30 km/h) conditions to prevent loss of fine-textured material and dust deposition on adjacent areas. If it is necessary to conduct salvage under these conditions, field-fit mitigation measures will be implemented to minimize erosion and

	dust generation (e.g., water application) as determined by a qualified registered professional (SEPSCP Section 7.3; AQDMP Section 8.2 and Appendix D).
	Soil salvage may occur under frozen conditions with the benefit of reducing soil compaction, but snow should be removed prior to salvaging to reduce undesired settling or erosion in stockpiles or reclamation areas. Avoid salvage where frost penetrates greater than 75% of the target soil profile, making it challenging to accurately segregate soils causing admixing.
	Where the water table is within 50 cm of the surface (e.g., wetlands), drain areas targeted for soil salvage using trenching[1] prior to salvage and manage salvage operations in accordance with the SEPSCP, as follows: • Establish erosion and sediment controls on stripped areas to reduce erosion risk and protect water quality, such as: – Temporary covers, such as coconut matting can also be applied in high-risk erodible areas (e.g., slopes); – Use berms, waterbars, and ditches to direct runoff away from rivers and streams; – Create sediment ponds to allow settling of sediments during higher-runoff events; and – Install silt fencing, straw wattles and check dams for additional sediment capture.
Soil Stockpiles	Salvage and stockpile soils in accordance with the Trigger Action Response Plan (TARP; Table 9.1-3) presented in the SMP to prevent loss of fine materials due to erosion and degradation of soil structure.

Notes:

AQDMP = Air Quality and Dust Management Plan.

SEPSCP = Surface Erosion Prevention and Sediment Control Plan.

[1] Trenches are dug along the edges of a salvageable wetland area and allowed to fill with water. Drained soil can then be salvaged and stockpiled.

9.7.1 Soil Salvage Procedures

Detailed soil suitability mapping and salvage procedures are provided in the SMP (Figure 8.2-1 and Section 9.1 respectively). The following is a summary of the soil salvage procedures:

- There is a surplus of available mixed-mineral surface soils for salvage relative to reclamation demands, therefore sufficient volumes can be obtained from the upper 0.3 m and there is no need to salvage the lower-quality deeper soils. Two exceptions exist for the 0.3 m salvage depth:
  - First, to meet volume demands, glaciofluvial surface soils will be salvaged to a depth of 0.5 m. While this extends beyond the most active biotic zone of the soil profile, the physical properties of glaciofluvial surface soils at this depth are still desirable and levels of organic matter and nutrients are still elevated compared to overburden[1].

[1] Overburden is defined as unconsolidated soil that underlies surface soils (> 0.5 m below the interface between organic and mineral soil horizons). These materials have not undergone pedogenesis, except the uppermost overburden (e.g., 0.5 to 1.0 m below the interface between organic and mineral soil horizons), which has undergone a lesser degree of pedogenesis than surface soil and has lower organic-matter content. Overburden within the Project area consists primarily of morainal deposits. Overburden, in the context of reclamation materials, does not include any waste rock material.

  - Second, organic surface soils will be salvaged to an average depth of 1.3 m. In the Project footprint, organic soils occur in wetlands that form in depressions and on floodplains.
- Stripping of overburden for engineered facility construction will be in accordance with geotechnical design specifications. The organic horizons of mineral soils will be salvaged with the underlying mineral horizons in one lift.

Organic, glaciofluvial and mixed-mineral surface soils will be segregated by qualified registered professionals based on parent-material characteristics. Maps of parent-material polygons will also be available to guide operators and supervising qualified registered professionals in delineating areas of the different reclamation materials. Supervising qualified registered professionals can additionally support the operators to delineate reclamation-material types through use of flagging and in-field signage.

9.7.2 Soil Stockpile Procedures

Soil stockpile design details, including consideration of stability and water management, are provided in the Stockpiles Geotechnical and Water Management Design Report (KP 2021b) and a Supplemental Stability Assessment Report (KP 2022). Soil stockpile locations will be in accordance with Figure 10.1-1 of the SMP.

Best management practices for operators with respect to soil stockpiles construction include:

- Select stable stockpile locations that are not at risk of requiring rehandling or intrusion by machinery over the stockpile life prior to use.
- Ensure that stockpiles are located at least 10 m from any materials that could negatively impact the quality of the stored reclamation materials, such as tailings, waste rock, or low-grade ore that may have elevated elemental concentrations.
- Segregate different classes of reclamation materials into separate stockpiles (OVB, glaciofluvial surface soil, mixed-mineral surface soil, and organic surface soil).
- Construct stockpiles to minimize wind and water erosion, and to meet the geotechnical stability standards required by the Code and engineered designs (Section 10.2 of the SMP), as applied to all landforms at Blackwater. Water erosion can be reduced by limiting the steepness of stockpile slopes to 3:1, creating surface microtopography and ensuring that salvaged reclamation materials are placed on well-drained areas. Avoid locating stockpiles in runoff pathways to ditches or watercourses to reduce the risk of sedimentation. If this is unavoidable, install appropriate erosion and sedimentation control measures as per the Surface Erosion Prevention and Sediment Control Plan.
- Construct stockpiles to minimize wind and water erosion, and to meet the geotechnical stability standards required by the Code and engineered designs (Section 10.2 of the SMP), as applied to all landforms at Blackwater. Water erosion can be reduced by limiting the steepness of stockpile slopes to 3:1, creating surface microtopography and ensuring that salvaged reclamation materials are placed on well-drained areas. Avoid locating stockpiles in runoff pathways to ditches or watercourses to reduce the risk of sedimentation. If this is unavoidable, install appropriate erosion and sedimentation control measures as per the Surface Erosion Prevention and Sediment Control Plan.
- Reduce erosion and invasive-species establishment by seeding stockpiles with non-propagating grass species, native grasses and forbs, and planting with tree and shrub species such as Sitka alder and trembling aspen (unless sufficient natural regeneration is occurring). Aggressive agronomic species should be avoided, as they will be transferred with the reclamation materials during placement and may not meet end land use objectives. Seeding or planting reclamation stockpiles with species intended for the closure landscape can also help build a seedbank in the reclamation material.

- Clearly mark stockpile locations and reclamation material types and ensure that personnel are aware of their presence to prevent inadvertent contamination, burial, or removal.

9.8 Air Quality

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Air Quality and Fugitive Dust Management Plan.

Fugitive dust is the Project's primary source of air emissions. Potential dust sources include material handling/re-handling, construction and use of unpaved roads, blasting, compaction, drilling, grading, material (including ore) loading and unloading, crushing and ore processing. Erodible surface areas such as stockpiles and the TSF beach) are also potential sources of fugitive dust. Non-dust air emission sources include mine fleet exhaust (multiple), backup diesel generators, NO_x and SO_2 from blasting and the existing diesel-fired putrescible waste incinerator. Measures (including best management practices) to mitigate potential air quality effects during construction are presented in Table 9.8-1.

Table 9.8-1: Air Quality Mitigation and Management Measures

Category	Mitigation/Management Measure
All	• Implement the TARP for fugitive dust in accordance with Table 9-1 of the AQDMP.
Material Handling	• Employees involved in material handling or management will receive training by a qualified person on the importance of minimizing material drop height (from excavator to truck, conveyor to stockpile, etc.) to reduce fugitive dust, noise, and vibration.
Concrete batch plants	• When unloading material, piles should form low piles (maximum height of approximately 10 m) that extend horizontally, where practical. • Employees involved in material handling or management will receive training by a qualified person on the importance of minimizing material drop height (from excavator to truck, conveyor to stockpile, etc.) to reduce fugitive dust, noise, and vibration.
Aggregate crushing and screening areas	• Equip the crusher and/or screener circuits with onboard water dosing during times of the year above freezing temperatures or other dust suppression measures (e.g., reagents) systems. • Apply water when temperatures are above freezing and there are very dry conditions (less than 0.25 mm/day of precipitation in the previous week). • Stockpiles should form low piles (maximum height of approximately 10 m) that extend horizontally as determined by the Construction Manager, where practical. • Use screener and crusher covers. • Check cover for tears, holes and cracks on a monthly basis. Repair as soon as possible.

Category	Mitigation/Management Measure
Borrow areas	• Apply water when temperatures are above freezing and there are very dry conditions (less than 0.25 mm/day of precipitation in the previous week). • Employees involved in material handling or management will receive training by a qualified person on the importance of minimizing material drop height (from excavator to truck, conveyor to stockpile, etc.) to reduce fugitive dust, noise, and vibration. • Develop new borrow areas only when and as required (to be determined by the Mine Manager). • Once suitable materials have been salvaged, place topsoil on disturbed areas and seed using a native seed mix to re-establish vegetative cover as soon as reasonably possible. • When unloading material, piles should form low piles (maximum height of approximately 10 m) that extend horizontally. • Minimize drop height from loaders and excavators (shovels) to the truck.
Topsoil stockpiles	• When unloading material, the piles should form low piles (maximum height of approximately 10 m) that extend horizontally. • Seed stockpiles to reduce erosion and establishment of invasive species.
MAR	• Speed limits will be established based on road design class, with the maximum speed limit of 50 km/h on all Project roads. • Reduce speed limits on Project-owned roads if weather conditions cause fugitive dust emissions and dust cannot be controlled by watering. • Speed limits are clearly marked through signage and enforced by site security through periodic checks using a radar speed gun. Personnel caught speeding will face disciplinary measures, and if violators are encountered they will be provided with constructive instruction on the importance of adhering to speed limits to limit dust generation. • Manage dust emissions from roadways in accordance with the Fugitive Dust Management SOP. • Water roads in accordance with Section 5.1.1 (Watering) of the Fugitive Dust Management SOP. • Apply dust suppressant reagents after spring melt (e.g., calcium chloride, magnesium chloride or other equivalent) as approved by the Mine Manager. • Grader maintenance with road crush as required. • Regular compaction. • Use coarse aggregate on roads with low silt content to reduce silt loading on roads.

Category	Mitigation/Management Measure
TSF and mine haulage and service roads	• Speed limits will be established based on road design class, with the maximum speed limit of 50 km/h on all Project roads. • Reduce speed limits on Project-owned roads if weather conditions cause fugitive dust emissions and dust cannot be controlled by watering. • Speed limits are clearly marked through signage and enforced by site security through periodic checks using a radar speed gun. Personnel caught speeding will face disciplinary measures, and if violators are encountered they will be provided with constructive instruction on the importance of adhering to speed limits to limit dust generation. • Manage dust emissions from roadways in accordance with the Fugitive Dust Management SOP. • Water roads in accordance with Section 5.1.1 (Watering) of the Fugitive Dust Management SOP. • Ensure an available fleet of water trucks to be deployed, weather depending (non-freezing conditions). • Apply dust suppressant reagents after spring melt (e.g., calcium chloride, magnesium chloride or other equivalent) as approved by the Mine Manager. • Use coarse aggregate on roads with low silt content to reduce silt loading on roads. • Grader maintenance with road crush as required. • Regular compaction.
Loads in transit in open beds.	• Install removable tarps to cover truck loads of fine material. • Use tackifiers, if necessary, to limit fugitive dust from loads of fine material.
Vehicles	• Maintain equipment in good working condition according to manufacturer's recommendations. • Restrict speeds and reducing idling (no-idling policy will be implemented, except for extenuating circumstances during the winter where cold starts and stopping could wear on mining equipment).

Notes: AQDMP = Air Quality and Fugitive Dust Management Plan; SOP = Standard Operation Procedure; TARP = Trigger Action Response Plan

9.9 Vegetation Management

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Invasive Plant Management Plan;
- Surface Erosion Prevention and Sediment Control Plan;
- Soil Management Plan; and
- Vegetation Management Plan.

Clearing, grubbing and earthworks will result in the loss of ecosystem functions. Fugitive dust deposition resulting from construction activities has the potential to affect plants, wildlife and fish, and may be elevated during periods of high winds and dry conditions. This is particularly relevant to areas adjacent to mine site roads. Table 9.9-1 presents measures (including best management practices) that will be implemented during construction to mitigate potential effects on vegetation in accordance with the VMP. Table 9.9-2

presents mitigation measures (including best management practices) that will be implemented to mitigate potential effects to riparian areas in accordance with the VMP.

Table 9.9-1: Vegetation Mitigation and Management Measures

Activity	Mitigation/Management Measure
Pre-clearing	Use setbacks of at least 10 m from the edge of non-impacted gullies or channels to avoid destabilization, as identified by the Environmental Monitor.
	Cutting prescriptions for each site will consider best management practices in Soil Conservation Planning and Practices in the Quesnel and Vanderhoof Forest Districts (FPB 2010; specifically Appendix C Timber Harvesting Practices Extension Note #1).
	Limit soil disturbance in non-cleared areas.
	Conduct vegetation clearing in accordance with the Fire Danger Class in the Wildfire Regulation.
	Conduct clearing around sensitive environmental features in accordance with the relevant SOP (Old-growth forest Management SOP, Rare and At-Risk Plant Species Management SOP, Riparian Area Management SOP, Wetland Management SOP).
	In areas with sensitive features where clearing cannot be avoided and soil disturbance is not required (e.g., for road edges, or to create safe setbacks from forest to buildings), use low-disturbance methods and removal techniques that are most appropriate, such as pruning, mowing, girdling, topping, hand-falling, or clearing on frozen ground.
	In areas where only tree removal is required, retain shrub and herbaceous vegetation to encourage a self-sustaining, native shrub community. Limit soil disturbance, as determined by the supervising qualified registered professional, through practices such as winter falling and machine work on snow, using low ground pressure machinery, and avoiding clearing during periods of high soil moisture.
	Transplantation of healthy trees from impacted areas to undisturbed areas or designated reclamation areas (the methods for transplantation of Whitebark Pine has been drafted in the Whitebark Pine Management Plan and will be provided in the Reclamation and Closure Plan).
	Avoid damage to residual tree roots or stems as this can increase risk of windthrow and disease.
	Salvage and retain woody debris in accordance with the Coarse Woody Debris Management SOP.
	Maintain clearing dimensions to areas approved by the Project Mines Act permit and Occupant Licence To Cut
Post-Clearing	Minimize soil degradation and erosion by leaving stumps and understory vegetation intact where possible. Soil degradation and erosion will also be minimized in adhering to the mitigations identified in the SMP, SEPSCP, and RCP.
	Manage fugitive dust on roads in accordance with the Fugitive Dust Management SOP and the TARP provided in the AQDMP (Table 9-1).

Activity	Mitigation/Management Measure
Post-Clearing *(cont'd)*	Vegetation management on Project roads (Mine Access Road and mine site roads) will be maintained to provide sightlines. Vegetation will be selectively brushed to prefer low growing species to maintain a vegetated cover. Revegetate roadsides with native species that avoid attraction of wildlife (e.g., no clover or other highly palatable species), in accordance with the VMP to reduce wildlife incidents. Species selection will be implemented by the EM in consultation with a qualified registered professional.
	A Qualified Professional will assess new edge areas adjacent to roads, work areas, and the transmission line for windthrow risk and hazard trees, and if risk levels are too high site-specific measures to reduce risk to an acceptable level will be developed. Measures will be consistent with relevant best management practices in Section 7 of the BCTS Windthrow Manual (Zielke et al. 2010), as determined by the qualified registered professional.

Notes: AQDMP = Air Quality and Fugitive Dust Management Plan; SEPSCP = Surface Erosion Prevention and Sediment Control Plan; SMP = Soil Management Plan; SOP = Standard Operating Procedure; TARP = Trigger Action Response Plan

Table 9.9-2: Riparian Area Mitigation Measures

Category	Mitigation/Management Measure
Buffers	A RMA will be preserved around wetlands, watercourses, and waterbodies located within the mine site, excluding the footprint of Project components and associated activities required to construct them, in accordance with the Riparian Area Management SOP. Work or activity within the RMA will only occur to the extent necessary for safety reasons to control invasive plants, or to install and maintain erosion or sediment run-off control measures.
Clearing Activities	Retain streamside vegetation wherever possible, including trees, shrubs, and ground cover, in accordance with the Riparian Area Management SOP.
	Remove all slash and debris that lands within the RMA to minimize the amount of disturbance to trees, shrubs or grass species, unless its removal will result in more damage than leaving it in place.
	Fall trees directionally away from stream banks and aquatic areas to minimize disturbance to riparian areas.
	The EM in consultation with a qualified registered professional will implement the following measures in accordance with WMMP, Section 3.3.2 to mitigate for loss and degradation of adjacent riparian wildlife habitats.
Construction Activities	Protect natural drainages and watercourses by constructing appropriate on-site sediment control devices (including but not limited to silt fencing, hay bales, multi barrier approaches where necessary, diversion ditches, sediment traps, sediment ponds) in accordance with the SEPSCP.
	Within the RMA, preferentially use heavy equipment with low-pressure tires over tracked equipment.
	The SEPSCP will be implemented and will identify erosion control measures (e.g., proper ditching, reducing slopes and placement of soil salvage piles, diversion and runoff collection ditches, sediment control ponds, erosion control mats).

Category	Mitigation/Management Measure
Equipment and Fueling	Machine inspections will occur daily when working in the RMA to determine if they are in good operating condition, clean, free of leaks, excess oil, and grease.
	No equipment refuelling or servicing (machines or hand tools) within an RMA to minimize risk of aquatic contamination in accordance with the Riparian Area Management SOP.
	Ensure all hydraulic machinery entering an RMA uses environmentally sensitive hydraulic fluids that are non-toxic to aquatic life and that are readily or inherently biodegradable.
	Keep a spill containment kit readily accessible onsite in the event of a release of a deleterious substance to the environment. Onsite staff will be trained in emergency response and spill reporting procedures in accordance with Fuel Management and Spill Control Plan. Any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities will be immediately reported to the Provincial Emergency Program 24-hour phone line at 1-800-663-3456. See Section 9 in FMSCP for further details on the Spill Response Plan.
Herbicides	Avoid the use of herbicides in accordance with the IPMP and Indigenous nation herbicide use policies.
	Comply with the Ulkatcho First Nation, Lhoosk'uz Dené Nation, Saik'uz First Nation, Nazko First Nation, Stellat'en First Nation, and Nadleh Whut'en First Nation herbicide policies in their Traditional Territories.
Timing Windows	All instream construction at stream crossings will consider Reduced Risk Timing Windows (July 15 to August 31) for Fish and Wildlife in Region 7 - Omineca (BC MWLAP 2004b). Any variances to complete instream works that are required will be pursued through FLNRORD authorization at the direction of a fisheries qualified registered professional.
	To protect nesting birds, vegetation clearing will only be undertaken during the period of August 1 through to April 30 to avoid contravention of Section 34 of the *Wildlife Act* and outside of sensitive timing windows identified in Table 13.1-1, where possible. If clearing must occur during sensitive timing windows, pre-clearing surveys and mitigations will be implemented. Mitigation measures, including buffer zones, will be outlined by a qualified registered professional on a site-specific basis following a risk-based assessment of the species in question, the habitat, and the type of Project activity and its potential to disturb wildlife. See Section 3.3.1 in the WMMP for additional information on pre-clearing and sensitive timing windows.

Notes: RMA = Riparian Management Area; SEPSCP = Surface Erosion Prevention and Sediment Control Plan; SOP = Standard Operating Procedure; IPMP = Invasive Plant Management Plan; WMMP = Wildlife Mitigation and Monitoring Plan

Invasive plants are non-native or alien to the ecosystem under consideration. Their introduction causes, or is likely to cause, economic or environmental damage, or harm to human health. In BC, the term invasive plant is synonymous with invasive alien plant. Noxious weeds are any invasive plant species designated by regulation to be noxious under the BC *Weed Control Act* and *Regulations*.
Mitigation measures (including best management practices) that will be implemented to prevent the establishment of invasive plants is presented in Table 9.9-3. Detailed measures to control and eradicate invasive plants are provided in the IPMP.

Table 9.9-3: Invasive Plant Mitigation and Management Measures

Category	Mitigation/Management Measure
Prevention	Site Security will perform a visual inspection for cleanliness (free of excessive dirt and debris above and beyond that reasonably expected from transport to site) on all earth moving equipment and vehicles upon arrival to the mine site.
	Maintain equipment storage areas free of invasive species in accordance with the Invasive Plant Management SOP.
	Through onboarding training, ensure to inspect clothing and vehicle/equipment undercarriages for seeds and plant tissue when working in, and prior to leaving, areas known to contain invasive plants in accordance with the Invasive Plant Management SOP.
	Maintain newly disturbed sites free of invasive plants in accordance with the Invasive Plant Monitoring SOP.
	Stabilize exposed soils and consider the drainage and gradient, length of time that areas would be left exposed to evaluate the need to re-seed with native seed mix, in accordance with the RCP.
	Restrict equipment and vehicle use to Project roads, trails and pullouts through a combination of training, mapping and signage.
Treatment	Appropriate treatment method will be selected in accordance with Section 8.2.2 of the IPMP. Avoid the use of herbicides in accordance with the IPMP and Indigenous nation herbicide use policies.
	Comply with the Ulkatcho First Nation, Lhoosk'uz Dené Nation, Saik'uz First Nation, Nazko First Nation, Stellat'en First Nation and Nadleh Whut'en First Nation herbicide policies in their Traditional Territories.
Cleaning Equipment	After working in areas with known infestations, clean vehicles and equipment at the infested site or in an area where contamination and seed spread is unlikely, such as a mud-free, gravel, concrete, or other hard surface. If this is not possible, a regularly maintained area will be used for cleaning, such as the truck washing bay.
	Equipment cleaning will be located outside any Riparian Management Area in accordance with the Riparian Area Management SOP. After cleaning, operators will inspect vehicle and equipment to ensure excess mud, soil, vegetation and debris is removed and left at the site of infestation.
	If vehicles or earth moving equipment can be confirmed as causing the spread of invasive plants or are working in areas of known infestations the following may be implemented, subject to the direction of a qualified person: a quarantine area may be established to block access to the infested area, treatment and control measures in the quarantine area, and use of portable wash stations.

Notes: RCP = Reclamation and Closure Plan; SOP = Standard Operating Procedure; IPMP = Invasive Plant Management Plan.

9.10 Wetlands

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Wetland Management and Offsetting Plan.

Potential effects to wetlands due to construction include loss of wetland extent/function resulting from site clearing, grubbing, and altered hydrological processes resulting in water table drawdown, and diversion of surface and seepage water. Potential causes of wetland degradation relevant to the discrete activity of construction include fugitive dust deposition, water quality degradation, noise pollution, and potentially light pollution.

Table 9.10-1 presents mitigation measures and best management practices that BW Gold will implement to mitigate potential effects to wetlands during the Project's Construction phase in accordance with the Wetland Management and Offsetting Plan. The Wetland Management and Offsetting Plan has been developed in accordance with EAC Condition 24 to include, among other items, the methods by which wetland conditions will be documented and monitored as well as the wetland offsetting plan for impacted identified wetlands.

Table 9.10-1: Wetland Mitigation Measures

Category	Mitigation Measure
Wetland Function	Maintain or enhance existing drainage connections when designing and installing culverts for cross drainage, and avoid creating outlets that either drain wetlands or constrict the natural outlet during construction.
	Locate facilities and topsoil piles within the mine site area away from wetlands, and/or minimize ground disturbance footprint.
	Minimize clearance of black spruce forest and maintaining hydrological regimes of wetlands near infrastructure.
	Avoid clearing in wetland RMA, unless the wetland is within the mine site footprint in accordance with the Wetland Management SOP to protect wetland function.
	Locate fuel storage and refuelling activities outside any wetland RMA, in accordance with the Riparian Area Management SOP.
	Place soil salvage stockpiles in locations where they will have no impact on natural drainages.
	Direct surface runoff from plant site grading, open pit development, TSF construction and waste rock storage area development to the TSF basin or other designed sediment control structures.
	Control metal leaching by separating contact and non-contact surface water through diversion dams and collection trenches.
	Minimize pesticide and fertilizer use around aquatic resources and before precipitation events to limit chemical runoff from entering wetlands.
	Replant native vegetation to expedite succession in accordance with the RCP.
	Use low ground pressure equipment or tracked equipment for work in areas with saturated soils.

Category	Mitigation Measure
Wetland Function *(cont'd)*	Use timber mats, driving mats, or log corduroys or other means of ground protection where necessary (e.g., to prevent vegetation disturbance, saturated conditions, etc.) to minimize disturbances to vegetation and reduce rutting.
	Minimize unnecessary soil disturbance where possible.
	Minimize the width of roads and trails consistent with maintaining safety and road design considerations.
	Design approaches to wetlands so that the surface runoff carrying potential sediment is diverted before entering the wetland.
	Manage unauthorized use of roads during and after construction and operations to minimize impacts to wetlands.
	Maintain road running surfaces, ditches and cross drains to minimize erosion and sediment delivery.
	Temporary and permanent road construction will follow guidance outlined for the appropriate soil conditions.
	Activities and works in and around wetlands will be designed and planned to minimize loss or disturbance of wetlands.
	Approaches to wetlands will be designed and constructed such that they are perpendicular to the margin of the wetland to minimize loss or disturbance of wetland vegetation.
	Plan and implement activities occurring near adjacent wetlands as determined by the SEPSCP to ensure deleterious substances (e.g., sediment, solvent, fuel, etc.) do not enter the wetland by installing sediment and erosion control mitigation measures such as, but not limited to silt fencing, hay bales, multi-barrier approaches, at the direction of the environmental monitor and supported by the QP.
	Clearing of wetland vegetation will be minimized to the extent practical. Pruning or topping of vegetation will be utilized instead of grubbing.
	Machinery will be washed, refueled and serviced in accordance with the Riparian Area Management SOP as to prevent any deleterious substances from entering the wetland.
	Machinery will be operated on land above the high water mark of wetlands as determined by the Environmental Monitor in a manner that minimizes disturbance to the wetland.
Wetland Extent	Establish 30 m of undisturbed vegetation buffer zone around wetlands located outside the Project footprint.
	Flag or otherwise identify clearing limits in accordance with the Wetland Management SOP.

Notes: IPMP = Invasive Plant Management Plan; RMA = Riparian Management Area; SEPSCP = Surface Erosion Prevention and Sediment Control Plan; RCP = Reclamation and Closure Plan; SOP = Standard Operating Procedure

9.11 Wildlife Protection

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Wildlife Mitigation and Monitoring Plan;
- Invasive Plant Management Plan;
- Vegetation Management Plan;
- Mine Site Traffic Control Plan;
- Air Quality and Fugitive Dust Management Plan; and
- Noise and Vibration Effects Monitoring and Mitigation Plan.

9.11.1 Mitigation and Management Measures

Project infrastructure has been designed to avoid or reduce potential effects on wildlife and wildlife habitat, including sensory disturbance (e.g., noise and light). Mitigation measures involving design changes are discussed in the WMMP and not discussed further.

Potential effects to wildlife and wildlife habitat during construction include alteration and loss of habitat, changes to wildlife movement, indirect and direct mortality, introduction of potential attractants, and changes to health. Table 9.11-1 identifies mitigation measures and best management practices that will be implemented to mitigate construction-related impacts to wildlife and wildlife habitat.

Table 9.11-1: Wildlife Mitigation and Management Measures

Category	Mitigation/Management Measure
General Wildlife Mitigation Measures and Best Management Practices	
Habitat Loss and Alteration	The EM in consultation with a qualified registered professional will implement the following measures in accordance with WMMP, Section 3.3.2 to minimize overall clearing and ground disturbance during construction: • Flag sensitive habitats adjacent to the construction footprint; • To retain the topsoil and vegetation root mat, grubbing, stripping, or removal of shrubs and herbaceous species will not be completed unless it is required for operations; • Progressively reclaim roads and infrastructure in accordance with the RCP when no longer required, including decommissioning of the existing exploration access road (during Project construction); • Use existing roads and cleared / disturbed areas rather than disturbing new areas; and • Retain coarse woody debris in accordance with the Coarse Woody Debris Management SOP (Locations of coarse woody debris piles/retention will be directed by a site supervisor on a site-specific basis).
	Riparian Area Management SOP will be implemented by the Construction Supervisor. The Riparian Area Management SOP identifies the safe and efficient work practices to manage and protect riparian areas adjacent to wildlife habitats.
	During clearing of the forest, the Construction Supervisor will implement mitigations for edge effects in accordance with WMMP, Section 3.3.2.

Category	Mitigation/Management Measure
Habitat Loss and Alteration *(cont'd)*	Mitigation measures identified in Section 8 of the VMP will be implemented by the Construction Supervisor during clearing activities to minimize the overall clearing and ground disturbance.
Transportation and Access	The Site Supervisor will implement the following access road use and haulage operating protocols; • When transiting to/from camp on the Kluskus FSR - check in with main office in Vanderhoof or at the camp before leaving, and when arriving at camp; • Radio positions along the FSR; • No speeding on the FSR; • Report any wildlife sightings, incidents or accidents on the FSR; and • Additional details are included in the Journey Management Package given to all Personnel.
	Other commercial users of Kluskus FSR will be notified regarding relevant wildlife safety provisions along roadways through signage and participation in the industrial road users group, with relevant measures incorporated into road use agreements.
	BW Gold will participate in the Kluskus FSR industrial road users group and safety groups throughout the Construction phase.
Wildlife Activity on Roadways	All mine vehicles and mobile equipment, including authorized private vehicles, will be equipped with or escorted by vehicles with two-way radios when travelling along Project-controlled roads.
	Wildlife logs will be maintained on site to include all recorded wildlife sightings, interactions, and incidents (and reported annually in the WMMP report). The EM will inform all staff/contractors of any locations of high animal activity on access roads and the appropriate actions to be taken, including seasonal changes in wildlife behaviour or presence. The EM, in consultation with a qualified registered professional, will determine appropriate actions depending on the circumstance and maintain overall responsibility for implementation of the recommendations.
	Wildlife will be given the right of way along all Project-controlled roads, and site orientation will include measures for avoidance of vehicle/wildlife encounters.
	Wildlife crossing signs will be posted where identified wildlife corridors intersect project roads, as identified through pre-construction surveys. This includes identification of amphibian crossings, such as near potential western toad breeding sites: • Wildlife crossings have been identified during pre-construction habitat surveys conducted during summer of 2021 and signs will be installed prior to initiating construction activities; • Two crossing have been identified on the Kluskus and Kluskus-Ootsa FSRs, BW Gold will notify FLNRORD and offer to install wildlife crossing signs prior to initiating construction activities; • Signage will be maintained and adaptively managed through all phases of the Project; • Signs will be posted along Project access roads to identify caribou sensitive areas, including migration routes and seasonal feeding areas; and • Cameras may be used to document trails where wildlife cross the road, or at locations where breaks have been plowed to allow crossing by moose.

Category	Mitigation/Management Measure
Wildlife Activity on Roadways *(cont'd)*	Wildlife incidents or mortalities will be addressed with adaptive management measures indicated in Section 1.4 of the WMMP, including potential adaptive management measures.
	If amphibian mortality on roadways is identified, adaptive management measures will be implemented in accordance with the WMMP such as additional consideration for amphibian passage (e.g., tunnel and fence systems or limitations on timing of traffic movement in that area).
	Speed limits on all Project roads are set at 50 km/h. Speed limits are clearly marked through signage and enforced by site security through periodic checks using a radar speed gun. Personnel caught speeding will face disciplinary measures, and if violators are encountered they will be provided with constructive instruction on the importance of adhering to speed limits to avoid wildlife incidents.
Road Condition Management	Vegetation management on Project roads (Mine Access Road and mine site roads) will be maintained to provide sightlines. Vegetation will be selectively brushed to prefer low growing species to maintain a vegetated cover. Revegetate roadsides with native species that avoid attraction of wildlife (e.g., no clover or other highly palatable species), in accordance with the VMP to reduce wildlife incidents. Species selection will be implemented by the EM in consultation with a qualified registered professional.
	Road salts will not be used for de-icing, unless as determined by the Mine Manager (in consultation with a qualified registered professional), other methods for de-icing and traction control do not meet safety requirements.
	All staff (including contractors) will be required to report carrion observed on roads. Once reported, carrion will be removed from roads promptly. Carrion management methods will be established in consultation with relevant authorities, and Aboriginal Groups. The EAC specifies relocating carrion to nearby areas to serve as a food source for wildlife, unless FLNRORD is not able to authorize removal and relocation. Industry best-practice is to incinerate road kill. FLNRORD will be notified via email within 72 hours of carrion resulting from mine activities.
	Dust suppression measures will be implemented by the EM to allow good line of sight, as defined in the Fugitive Dust Management SOP (Appendix D of the Air Quality and Fugitive Dust Management Plan). The Fugitive Dust Management SOP provides the safe and efficient work practices to manage fugitive dust emissions from use of the Mine Access Road, haul and service roads. The SOP provides guidance to personnel to assess working conditions to prevent excessive dust from equipment or processes.
	The CM will implement the management of snow bank heights using blading or other clearing techniques, and maintenance of escape pathways at wildlife corridors along roadways to keep banks and pathways within heights decided in consultation with regulators, and Aboriginal and Indigenous groups once the road is constructed.

Category	Mitigation/Management Measure
Species-specific Mitigation Measures and Best Management Practices	
Amphibians (WMMP Section 4.1)	Avoidance of amphibian breeding ponds will include no-work buffers surrounding known breeding ponds and taking into account BC *Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia* (MOE 2014b), which recommends a 30-150 m buffer zone. The no-work buffer will be flagged in consultation a qualified registered professional.
	If avoidance of breeding ponds is not possible and salvage is required, it will be conducted following *Best Management Practices for Amphibian and Reptile Salvages in British Columbia* (MFLNRO 2016) and in consultation with a qualified registered professional as follows (in accordance with DS Condition 8.11): • Obtain a salvage permit under the *Wildlife Act*; • Conduct a baseline inventory and assessment, including a comprehensive risk assessment; • Consider habitat type when determining capture techniques, inventory and salvage timing, and capture effort; • Conduct salvage during the time of year when the least number of species and life stages will be affected; and • Where possible, create a compensation site (e.g., construct or restore a wetland) instead of using naturally occurring habitat for release.
	Under the supervision of a qualified registered professional, toads will be salvaged from on-site breeding ponds prior to clearing activities that cannot be scheduled outside of sensitive periods in accordance with DS Condition 8.11. Prior to an amphibian salvage, an Amphibian Salvage SOP will be produced by a qualified registered professional.
	All staff will follow vehicle and equipment cleaning procedures, after working in areas with known invasive plants in accordance with IPMP Section 8.2.1.
	Effluent will meet effluent quality criteria (as defined in discharge permits) prior to discharge to the receiving environment. Refer to MSDP (Section 10) for potential nonconformities and corresponding corrective actions (i.e., mitigation measures) associated with mine site discharges.
Bats (WMMP Section 4.2)	Retain trees or stands that may support bat roosts.
	Retain key bat habitat resources where possible.
	Clearing work will be planned for outside of the sensitive period for bats (see Table 13.1-1).
	If clearing must occur during the sensitive period for bats (see Table 13.1-1), then the inventory of potential hibernacula and roost features identified during pre-construction surveys will be reviewed by a qualified registered professional prior to disturbance to determine whether bats are using the area and provide direction to the CM.

Category	Mitigation/Management Measure
Bats (WMMP Section 4.2; *cont'd*)	Site-specific buffer distances will be recommended by a qualified registered professional to the CM to be implemented during clearing. The buffer distances will depend on the species present and intensity level of activity (BC MFLNRO 2014; Holroyd and Craig 2016). Buffer zones will be established by a qualified registered professional around active hibernacula and active roosts, in consultation with Aboriginal Groups and relevant authorities, and considering recommendations in the *Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area* (BC FLNRO 2014).
Caribou	Refer to the Caribou Mitigation and Monitoring Plan.
Moose (WMMP Section 4.4)	Construction activities should avoid moose habitat, such as salt licks and wetlands, where possible.
	Avoid: If a mineral lick is identified, the lick will be avoided if possible. Mitigate: If a mineral lick is identified, mitigation will include: • Manage vegetation to retain vegetation cover surrounding the lick. • Survey the area to identify movement corridors and trails to the lick (survey to be conducted by a biologist). • Use cameras to monitor any mineral licks and trails for use. • Put mitigation in place including road signage and training for staff if any trails to mineral licks cross project roads. Signage and training will indicate the species using the lick, location of the trail, and times of year when animals using the trail and crossing the road are more likely. Restore: If vegetation has already been cleared in the area of the lick, but it is outside of the Project footprint, then the site will be restored by replanting with native vegetation. Note that if the mineral lick is inside the project footprint, is due to be removed for installation of infrastructure, and if that infrastructure can not be re-designed to preserve the mineral lick, then the mineral lick may be required to be removed. This would be reported in the annual WMMP Report along with a clear rationale for this exemption and identification of alternative measures that can be applied.
	Limit sightlines along new access roads (e.g., by curving the road, allowing roadside vegetation to grow up, and limiting the width of the cleared right of way), where allowable for the safe operation of the road.
	To limit disruption to moose during construction, mitigation measures will be implemented in accordance with the NVMP (as determined by a qualified registered professional) including: • Use noise abatement; • Schedule construction activities at noise sensitive locations and times; and • Avoid low altitude flights except on final approach and take-off.

Category	Mitigation/Management Measure
Furbearers (WMMP Section 4.5)	Construction activities should avoid sensitive wildlife seasons for American marten, fisher, and wolverine (13.1-1). Construction activities will be planned outside of this period unless not technically feasible, as determined by the Mine Manager.
	If activity is being proposed during sensitive time periods for furbearers (13.1-1), no work buffer zones will be established by a qualified registered professional and implemented by the EM. The buffer zones will take into account FLNRO (2014) and dens identified during pre-construction surveys; recommended buffer zones vary according to species and activity. Mitigations will be completed as required by DS Condition 8.10.
	• If a no work buffer zone is established, Table 1 minimum buffer zones of 50 m indicated in EAC Condition 23c will be used surrounding identified dens. • If a buffer zone is not possible a qualified registered professional will determine mitigation measures based on site-specific characteristics including the size of the feature, the species involved, and the intensity level of planned activities. This may include rescheduling of work. Mitigation measures will also be in accordance to EAC Condition 23c: *"Should the survey or assessment determine that there is furbearer denning habitat within the Project Area, the plan must identify mitigation measures to be applied during the denning period, as determined by a Qualified registered professional, if avoidance is not possible, and in consideration of BC Environmental Mitigation Policy, including Procedures for Mitigating Impacts on Environmental Values (BC EMP)."*
Grizzly Bear (WMMP Section 4.6)	Construction activities should avoid sensitive wildlife seasons for grizzly bear as defined in the *Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area* (MFLNRO 2014). The sensitive wildlife seasons for grizzly bear is provided in Table 13.1-1.
	• A minimum buffer distance of 60 m distance will be established if an active grizzly bear den is identified during Project construction. Buffers will be determined by a qualified registered professional and will be based on site-specific characteristics including the intensity level of planned activities, and may exceed 60 m in some circumstances. • If activities must occur within the buffer zone of a potential den, additional assessment may be conducted to determine occupancy, in consultation with a qualified registered professional, FLNRORD Indigenous groups and Aboriginal Groups.
	Two dens were identified in a boulder field within mature forest was located during field surveys at the southwest corner of the mine site (northwest corner of Mt. Davidson) which has high suitability for grizzly bear denning (see Figure 4.5-2 in the WMMP). The den site in the boulder field will be avoided with a buffer of 200 m in all directions; if avoidance is not possible during the denning season, additional monitoring may be done to determine occupancy, such as reviewing the wildlife camera footage and using a Forward Looking Infrared (FLIR) camera.
	Waste management practices will be implemented by the EM to reduce attractiveness to bears, including measures for food preparation and storage, and waste storage and disposal.

Category	Mitigation/Management Measure
Birds (WMMP Section 4.7)	Avoid vegetation clearing during the breeding season for birds in accordance with Table 13.1-1, unless otherwise authorized. If vegetation clearing must occur during the breeding season, a qualified registered professional will conduct pre-clearing surveys, and determine no-work setbacks around any nests.
	Wildlife trees will be retained as snags if they pose little to no risk to human safety.
Invertebrates (WMMP Section 4.9)	Many mitigation measures for invertebrates are common with other wildlife species. Refer also to the VMP, WMOP, and SEPSCP.

Notes:

DS = Federal Decision Statement; EAC = Environmental Assessment Certificate; FLNRORD = Ministry of Forests, Lands, Natural Resource Operations, and Rural Development; FSR = Forest Service Road; IPMP = Invasive Plant Management Plan; MSTSP = Mine Site Traffic Control Plan; RCP = Reclamation and Closure Plan; SOP = Standard Operating Procedure; VMP = Vegetation Management Plan; WMMP = Wildlife Mitigation and Monitoring Plan

9.11.2 Preventative Protocols

Preventative protocols have been developed to protect wildlife against introduced pathogens or invasive species. These protocols primarily apply to cleaning and transport of equipment between sites, which applies for any pre-clearing and construction work in aquatic habitats (for amphibians) and forested habitats (for bats) and disturbed habitats, such as roadsides (for invasive plants). Survey and monitoring protocol references are included, and may be required if handling wildlife or in-water work is required.

Chytridiomycosis Prevention Protocol

Chytridiomycosis is an infectious disease in amphibians transmitted by the aquatic-spreading chytrid fungus. Prevention protocols require cleaning and possibly disinfecting equipment brought to the site, prior to being deployed for work in wetland areas, including construction and clearing equipment following protocols provided in Appendix D. Truck and road-bound vehicles are exempt.

General cleaning protocols for field work around wetlands (i.e., amphibian surveys, salvage, wetlands surveying) will follow BC MOE (2008): *Standard Operating Procedures: Hygiene Protocols for Aquatic Field Research*.

White Nose Syndrome Prevention Protocol

Bat populations are threatened by white nose syndrome, a deadly and rapidly spreading disease caused by a fungus (*Pseudogymnoascus destructans*). Prevention protocols, including reporting and cleaning procedures are provided in Appendix E: *Western Canada White Nose Syndrome Transmission Prevention* (CWHC 2015).

Any signs of sick/infected animals will be reported to supervisory personnel and regulators will be promptly notified. Reporting procedures for wildlife sighting and signs will be covered in the Site Orientation and training.

9.12 Fish and Fish Habitat

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Surface Erosion Prevention and Sediment Control Plan; and
- Fish Salvage and Relocation Plan (Appendix F).

Construction activities such as clearing and grubbing, excavation and soil handling in close proximity to waterbodies have the potential to result in the harmful alteration, disruption or destruction of fish habitat due to in-water works, alteration of flows and sediment release, and fugitive dust. Construction may also create conditions that could result in trapping or stranding of fish. The below mitigation measures have been developed.

Table 9.12-1 identifies measures that will be implemented to mitigate potential effects on fish and fish habitat during Project construction when undertaking activities near water.

Table 9.12-1: Fish and Fish Habitat Mitigation Measures

Category	Mitigation/Management Measure
Reduced Risk Timing Windows	If instream construction works and activities are scheduled outside of reduced risk timing windows (Omineca Region is July 15 to April 15 [rainbow trout]), a qualified registered professional will be engaged to determine specific mitigation measures to be implemented in accordance with provincial and federal requirements for working outside of timing windows.
Clearing	If clearing activities including the final clearing footprint (e.g., machinery and equipment movement, or clearing and grubbing) are planned to occur adjacent to or within riparian areas, the Riparian Area Management SOP will be implemented by the Construction Supervisor. The Riparian Area Management SOP identifies the safe and efficient work practices to manage and protect riparian areas.
	During all clearing activities, the SEPSCP will be implemented by the EPCM Contractor and other contractors that report to the CM. The SEPSCP identifies erosion control measures to prevent exposed soils from being entrained by water or wind, sediment controls to prevent sediment mobilizing into natural waterbodies impacting fish and aquatic life and the removal of sediment suspended in water once erosion has occurred. This includes proper ditching, installation of silt fencing and reducing slopes and placement of soil salvage piles, diversion and runoff collection ditches, sediment control ponds, erosion control mats and use of flocculants.
Angling	No angling is permitted by employees or contractors while they are on the mine site or travelling to/from the mine site.

Category	Mitigation/Management Measure
Aquatic Resources	The EPCM contractor and other contractors that report to the CM will ensure that DFO's Measures to Protect Fish and Fish Habitat (DFO 2019) as determined by a qualified registered professional are implemented. Measures may include: • Prevent the death of fish by avoiding use of explosives in or near water, planning in water work, undertaking or activity to respect timing windows to protect fish, including: their eggs, juveniles, spawning adults, and the organisms upon which they feed and migrate. • Maintain riparian vegetation by: – maintaining an undisturbed vegetated buffer zone between areas of on-land activity and the high water mark of any water body – using existing trails, roads or cut lines wherever possible – avoiding tree removal – using methods to prevent soil compaction, such as swamp mats or pads • Prevent the harmful alteration, disruption or destruction of fish habitat by avoiding: – conducting any work, undertaking or activity in water – placing fill or other temporary or permanent structures below the high water mark – fording of the watercourse – disturbing or removing materials from the banks, shoreline or waterbody bed, such as: – sand – rocks – aquatic vegetation – natural wood debris – building structures in areas that: – may result in erosion and/or scouring of the stream bed or banks – are inherently unstable, like: – bends – meanders – floodplains – alluvial fans – braided streams • Maintain fish passage by avoiding changing flow or water level or obstructing or interfering with the movement and migration of fish. • Implement the SEPSCP.
	Approved Work Practices for Managing Riparian Vegetation (BC Hydro et al. 2003) will be implemented by EPCM Contractor and other contractors that report to the CM. The main methods for managing riparian vegetation include pruning, slashing, mowing, topping, girdling, hinging and hazard/danger tree removal. The EM in consultation with a qualified registered professional will determine the appropriate prescriptions for the construction activity.
	• The Riparian Area Management SOP will be implemented by the Construction Supervisor that will identify the safe and efficient work practices to manage and protect riparian areas. • Adhere to mitigation measures identified on environmental constraint mapping.

Category	Mitigation/Management Measure
Aquatic Resources *(cont'd)*	To prevent entry of contaminant materials in water: • Implement spill response plan immediately in the event of a spill of contaminant materials. • Maintain spill response kits on site with the appropriate type and volume of material specific for each piece of equipment that handles or transports contaminant materials (including fuel), including: – Pickup trucks; – Dump trucks; – Commercial transport trucks; – Excavation equipment; and – Fuel trucks. – Fuel Stations and bulk fuel farms – Chemical storage areas – Secondary containment berms • Stop work and contain contaminant materials to prevent dispersal. • Report any spills of sewage, oil, fuel or other contaminant materials whether near or directly into a water body. • Ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse. • Clean up and appropriately dispose of the contaminant materials. • Plan activities near water such that materials and chemicals don't enter the watercourse. • Maintain all machinery on site in a clean condition and free of fluid leaks to prevent any contaminant materials from entering the water. • Wash down tools and equipment at designated wash facilities, refuel and service machinery and store fuel and other materials for the machinery in outside of the RMA and areas with significant downslope to a watercourse to prevent any contaminant materials from entering the water. • Provide containment facilities for wash-down water and appropriate disposal of material. • Dispose all waste materials above the high water mark of nearby waterbodies to prevent entry.
Crossing of Fish-Frequented Streams	• Fording of a stream for the purpose of moving equipment (i.e., one-time crossing only, over and back) will be authorized by the EM in consultation with a qualified registered professional. Fording of streams will only be completed if the channel width at the crossing is no greater than 5 m from the ordinary high water mark to ordinary high water mark (as per DFO Interim Code of Practice: Temporary Stream Crossings [DFO 2020]). • Should fording be required, the EM in consultation with a qualified registered professional will provide measures to protect fish and fish habitat in accordance with 1) DFO Interim Code of Practice: Temporary Stream Crossings (DFO 2020) and 2) Fish-stream Crossing Guidebook (FLNRO 2012). • For works identified in Part 3 of the Water Sustainability Regulation (B.C. Reg. 11/2021), the EM in consultation with a qualified registered professional will submit notification(s) to relevant authorities prior to undertaking Authorized Changes.

Category	Mitigation/Management Measure
Fish Salvage (Palmer 2021c)	Fish salvage efforts will be staged according to the construction schedule.
	Fish barriers (e.g., permanent fish fences, barrier nets) will be erected immediately downstream of all planned construction activities in Reach 6 of Davidson Creek, Creek 661 tributaries (Creek 505659 - Reach 5; Creek 146920 - Reach 3; Creek 543585 - Reach 2), and the outlet of Lake 1682. These barriers will be erected after spring freshet ends and water levels are low enough to construct temporary and permanent fences. This timing will prevent adult rainbow trout from migrating upstream from Lake Tatelkuz or downstream from Lake 1682 to spawn in areas where fish are to be removed and relocated.
	The preferred timing for fish salvages in the main stems of Davidson Creek and Creek 661 will be when stream temperatures are above 5°C, as determined by temperature-related restrictions for electrofishing. It is possible to secure salvage permits for periods outside the reduced risk window including variances to the 5°C threshold for electrofishing with MFLNRORD stressing the use of passive methods first (QP discretion). Salvages later in the year become more labor intensive and time consuming since salvage methods will be restricted to minnow trapping and netting methods. This might be further complicated once streams become ice covered which will likely require ice to be cleared prior to salvage. If BW Gold were to request a variance there would be the provision of clearly outlining how fish mortality would be mitigated during sampling and transport.
	All water bodies requiring fish salvage will be salvaged, with the majority of the salvage targeted to occur occurring in Year -2, but pending receipt of the *Fisheries Act* Authorization and fish salvage permits.
	Remove fish from streams and wetlands/ponds to be dewatered, by removing fish until catch-per-unit-effort reaches near-zero, as determined by a qualified registered professional.
	All captured fish will be temporarily held in clean containers holding water from the watercourse where the fish were captured. In situ water quality data (e.g., temperature, pH, dissolved oxygen, conductivity) will be collected during salvages. Captured fish will be visually checked for signs of stress, and where necessary, measures will be applied to ensure fish health such as aeration, changing the water, expedited release at designated release location, and provision of cover within holding containers.
	Under the guidance of and determined by a qualified registered professional: • Captured/collected fish will be transferred and released at designated locations in lower Davidson Creek, lower Creek 661, and Lake 1682 based on available access. • The duration for which fish are held in containment will be minimized and adjusted, as required based on fish health. • Precautions will be taken to ensure fish are minimally affected by the transfer process (e.g., driving slowly and ensuring road surface is in good condition so as to avoid shaking/vibration of fish tanks, cooling water with ice during hot weather, and aerating fish tanks to ensure adequate dissolved oxygen). • Fish will be released in suitable locations based on habitat suitability, fish density and other considerations. • Use of several release sites will avoid potential issues with local increased competition for food and increased predation by birds and mammals. • Release fish into slow-moving areas such as pools and back eddies to allow them time to acclimatize. Prior to release, water quality will be measured in situ at release locations, to ensure conditions are similar to the capture locations and holding tanks.

Category	Mitigation/Management Measure
Fish Salvage (Palmer 2021c; *cont'd*)	During the dewatering process, deep pools will be inspected and, where necessary, any remaining fish will be collected and transferred.
	Stop nets will be placed across the stream to prevent fish re-entry to salvaged areas that have not yet been dewatered.
	Once fish salvage is complete, a semi-permanent fish barrier will be erected immediately downstream of the Lake 1682 outlet to prevent fish movement downstream until the lake is isolated during construction.

Notes: RMA = Riparian Management Area; SEPSCP = Surface Erosion Prevention and Sediment Control Plan; SOP = Standard Operating Procedure

9.13 Non-traditional Land Use

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Invasive Plant Management Plan;
- Vegetation Management Plan;
- Mine Site Traffic Control Plan; and
- Noise and Vibration Effects Monitoring and Mitigation Plan.

Construction activities may interfere with the use and access to Crown and third party tenures held by other parties or public access. Table 9.13-1 identifies measures that will be implemented to mitigate potential effects with respect to non-traditional land use during construction on the mine site and off-site infrastructure.

Table 9.13-1: Non-traditional Land Use Mitigation Measures

Category	Mitigation/Management Measure
Livestock and Agriculture	If livestock access to water supply is curtailed with construction of mine infrastructure or habitat offsetting (e.g. cattle exclusion fencing from fish habitat offsetting): • The EM will Identify alternative watering locations in discussion with the land and/or livestock owner(s).
	Cattle movement into the transmission line right of way (ROW; Land File 0194075) and fisheries habitat offsetting works will be restricted with: • The installation of temporary/permanent fencing along active pastures, in consultation with the relevant landowner.
	Facilitate movement of livestock and farm machinery across ROW corridors, where applicable.
	To minimize compaction of agricultural soil: • Project vehicles will be restricted to use the ROWs and designated access roads near Project development areas through training and signage.

Category	Mitigation/Management Measure
Livestock and Agriculture *(cont'd)*	To minimize the introduction and spread of invasive plants: • The EM will implement the general mitigation measures, vehicle and equipment cleaning protocols, in accordance with the Invasive Plant Management Plan. • The Departmental Manager will implement the Invasive Plant Management SOP relevant to their area.
	To avoid potential impacts to livestock during construction activities, livestock owners will be notified of the construction schedule and activities to allow livestock to be moved to other pastures if necessary and/or where applicable.
Groundwater	Protect groundwater wells during construction activities with temporary fencing within 2 m of the well.
Timber	To minimize the potential escape of beetles from infested logs during clearing, handling, and hauling of beetle infested wood the Site Supervisor will implement the following mitigations as guided by a qualified registered professional and in accordance with guidance provided by FLNRORD: • Determine if woody debris stored on site have bark beetles and if noted, adopt measures to control infestation and spread (determined by a qualified registered professional). • Assess windthrow to determine if bark beetles require salvage of downed trees. • Prior to hauling beetle infested wood, determine the high beetle flight period and reduce transport windows accordingly.
	Provide timber from transmission line clearing to the Fraser Lake Community Forest.
Access	Public access to recreational and snowmobiling trails that are affected by construction activities will be managed by: • Adjustment of construction activity schedule; or • Erect appropriate signage (as determined in consultation with FLNRORD) on affected recreational and snowmobiling trails, if adjusting scheduling is not possible.
	If temporary closures on affected access routes, including water access (e.g., put-in places and points) are required the EM will: • Implement temporary access restrictions in accordance with the MSTCP where necessary to protect human health. • Erect appropriate signage to provide notice of temporary closures.
Noise	To limit disruption to sensitive receptors (hunting, guide outfitting and trapping) mitigation measures will be implemented in accordance with the NVMP (as determined by a qualified registered professional) including: • Use noise abatement. • Schedule construction activities at noise sensitive locations and times. • Avoid low altitude flights except on final approach and take-off.

Category	Mitigation/Management Measure
Schedule	Provide the construction schedule to tenure holders and recreational groups (e.g., Northwest Brigade Paddling Club, nearby lodges and the local offices of BC FLNRORD) overlapping the Project, 30 days prior to the start of construction and resolve any issues related to access as per appropriate industry and provincial standards, guidelines and best practices.

Notes: FLNRORD = Ministry of Forests, Lands, Natural Resource Operations, and Rural Development; MSTCP = Mine Site Traffic Control Plan; NVMP = Noise and Vibration Effects Monitoring and Mitigation Plan; SOP = Standard Operating Procedure

9.14 Archaeological and Cultural Heritage Resources

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Cultural and Spiritual Resources Management Plan.

Table 9.14-1 identifies measures that will be implemented to mitigate potential effects with respect to known and unknown archaeological and cultural heritage resources during construction. As new resources may be discovered during the course of construction, a Chance Find Procedure has been developed and is included as Appendix G.

Table 9.14-1: Archaeological, Heritage and Spiritual Resource Mitigation Measures

Category	Mitigation/Management Measure
Known Archaeological Sites	The following measures will be completed when Project activities are located within 0 to 50 m of a known site: • The Project archaeologist will flag or delineate an area of at least 30 m around the site and mark as a “No Work Zone” from the site boundary to align with Archaeology Branch’s Remote Access to Archaeological Data areas of high archaeological potential. • If the site is impacted, the EM contacts the Indigenous groups and the Project Archaeologist to determine if additional mitigation measures are required. The EM will be engaged on the proposed mitigation measures. • Sites that are identified by Indigenous groups as confidential will be depicted as polygons, including an area of at least 50 m around the site, on Project maps and marked as a “No Work Zones” around the site but will not be delineated on the ground. • If the impacts to the site will occur, then mitigation must be conducted prior to impact. Procedures to record, analyse and mitigate effects on a site will be determined in consultation with the BC Archaeology Branch and affected Indigenous groups as per the *Heritage Conservation Act* permit and carried out by an archaeologist under a *Heritage Conservation Act* (Section 12.2 heritage investigation and/or Section 12.4 site alteration permits). • Exact mitigation measures will be dependent on the specifics of the archaeological site and the levels of impact. Investigations of archaeological sites under Section 12.2 of the HCA generally involve detailed mapping, photography, and systematic data recovery through surface collection and controlled excavations of 1x1 m units if subsurface deposits are present.

Category	Mitigation/Management Measure
Known Archaeological Sites *(cont'd)*	• Site Alteration Permits issued under Section 12.4 of the HCA may include additional requirements such as artifact collection and monitoring of impacts. • Any artifacts collected during archaeological assessment will be sent to the Exploration Place Museum and Science Centre in Prince George, BC or another approved repository identified in the relevant Section 12.2 or 12.4 permit under the *Heritage Conservation Act*.
	The following measures will be completed when Project activities located within 50 and 150 m of a known site: • The Project Archaeologist will flag or delineate an area of at least 30 m around the site and mark as a "No Work Zone" from the site boundary. • Annual monitoring of the known sites.
Known Historic, Cultural, Spiritual, and Paleontological Sites	There is one documented historic cabin site within the mine site. If avoidance is not possible through final design and permitting, and artifacts or features associated with this site will be impacted, Aboriginal Groups and the local museum will be consulted and given the opportunity to collect/preserve artifacts associated with this site.
Culturally Modified Tree Sites (CMTs)	• Prior to alteration to post-1846 CMTs the relevant/affected Indigenous communities will be consulted to determine possible preferred mitigation measures. • Common mitigation measures for post-1846 CMTs with cultural significance include: detailed measurements and photography, removing and preserving the modified portion of the tree, or removing a cross-section (cookie) of the modified portion of the tree.
Trails	If a trail is encountered during construction: • The relevant/affected Indigenous communities will be consulted to determine possible preferred mitigation measures prior to the alteration of a trail. • Possible mitigation measures for recording trails include photography and detailed mapping of the route and surrounding features.
Paleontological Sites	If paleontological sites are encountered: • Work will be stopped pending consultation with the Fossil Management Office to determine an appropriate repository; and • The Project Archeologist will flag or delineate the site by an area of at least 30 m around the site and marked as a "No Work Zone" from the site boundary.
Chance Finds	The Project Archaeologist will implement the Archaeological and Cultural Heritage Chance Find Procedure (Appendix G) if there is a suspected discovery of archaeological, heritage, cultural, spiritual, or paleontological resources.

10.0 Fuel Management and Spill Response Strategy

During construction, there is potential for spills of substances that are deleterious to fish and fish habitat, wildlife, vegetation and soil quality. Common substances that pose a risk include gasoline, diesel, hydraulic fluid, transmission fluid, engine oil and lubricants (grease). Chemicals and materials stored onsite include janitorial cleaning products for the exploration camp, lubricants, hydraulic fluids, and greases for mobile equipment, pressurized gases for welding, paints and solvents for the exploration camp. During construction, small quantities of these chemicals and materials will be stored and used onsite. Bulk fuels will be stored for the construction equipment fleet.

Requirements for the storage, transfer, and handling of chemicals and fuels are outlined in:

- A Field Guide to Fuel Handling, Transportation, and Storage. 3rd Edition 1.0. (MWLAP 2002);
- *Health, Safety and Reclamation Code for Mines in British Columbia* (the Code; MEM 2017), specifically the following sections in the Code:
  - Section 2.3.4 – Proper Containers;
  - Sections 2.13.1 to 2.13.20 – Workplace Hazardous Materials Information Systems; and
  - Sections 2.3.3 – Storage of Hazardous Materials.

Relevant management plans associated with spill prevention response include:

- Fuel Management and Spill Control Plan; and
- Chemicals and Materials Storage, Transfer and Handling Plan (including the Cyanide Management Plan).

Table 10-1 presents measures that will be implemented to prevent and respond to spills during Construction.

Table 10-1: Spill Prevention and Response Mitigation and Management Measures

Topic/ Activity	Mitigation/Management Measures
Transportation	BW Gold will require emergency response plans from fuel trucking contractors and request that it includes reporting requirements to Indigenous nations when off-site or en-route.
	Fuel will be transported in containers and vehicles that comply with the federal *Transportation of Dangerous Goods Act* and the provincial *Transport of Dangerous Goods Act* hazard classification.
	Tank trucks must be inspected by a facility registered by Transport Canada. Visual inspections will be done every two years and pressure tests will be done every five years.
	Containers for the transportation of fuel will be labelled to communicate the hazard the material represents, made of a material that is compatible with the transported fuel, and in good condition (not damaged, rusting or leaking).
Transportation *(cont'd)*	Vehicles for the transportation of fuels will be labelled to communicate the hazard the material represents.

Topic/ Activity	Mitigation/Management Measures
	Tanks and containers with a capacity of greater than 50 gallons (230 litres) used for the transportation of flammable liquids or combustible liquids, shall conform to the requirements for the construction of cargo tanks on tank vehicles.
	Fuels will be transported separately from other hazardous or non-compatible materials.
	Transportation route plans will be designed to minimize the chance of a potential spill and to minimize the effect of a spill, should one occur.
	Transport containers will be properly secured and positioned to allow safe access and handling of containers.
	Containers of 5 gallons (23 litres) or less should be stored in an equipment box (Truck box/slip, Tidy Tanks) of a vehicle, reducing the risk of the container to bounce and spill.
	The slip tank will be regularly inspected for leaks and cracks. The slip tank will be repaired or replaced as required to maintain tank integrity.
	The spill response plan and a spill response kit, capable of containing and absorbing fuel spills will be available in all vehicles that are used for the transportation of fuel.
	Employees will be prohibited from smoking in and around fuel transport containers and vehicles.
	All bulk fuel drivers will: • Be trained and have CPPI Drivers Certification Training and Transportation of Dangerous Goods certification course or equivalent; • Be trained in the relevant sections of the TDG Regulations as applicable to their job and have ready access to their certification; • Be trained on the Spill Response Plan and spill reporting requirements both within and outside the mine site boundary; • Ensure no smoking or open flames are used around the fuel stations at any time; • Wear a hardhat and safety glasses at all times; • Yield to larger traffic; • Obey all posted speeds within and outside the mine site boundary; • Have all lights and markers turned on; • Follow the designated route; and • Review site delivery procedures.
Storage and Inventory Control	Fuel tanks will be CSA approved and comply with regulations and recommended practices described in A Field Guide to Fuel Handling, Transportation, and Storage (BC MWLAP 2002) and the BC Fire Code. Tanks will bear a current Underwriters Laboratories of Canada certification plate or label.
Storage and Inventory Control *(cont'd)*	The Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products (CCME 2003) states that all aboveground storage tank systems containing petroleum products and having a single or total capacity of more than 4,000 litres (880 gallons) at a site shall register all storage tanks of the system with the authority having jurisdiction.

Topic/ Activity	Mitigation/Management Measures
	Tanks have not yet been selected, but will follow legal requirements and consider best practices in the selection of leak detection and tests.
	Storage tanks must be installed on firm foundations designed to minimize uneven settling and corrosion. Multiple tanks must be separated by a minimum of 1 m.
	An oil/water separator is required to treat storm water effluent at all bulk plants and tank farms that have a cumulative storage capacity that is greater than 22,000 gallons (100,000 litres).
	Tanks and sumps will have high-level alarms.
	Fuel will be stored in containers in good condition that are designed and constructed for fuel storage.
	To minimize the risk of fuel leaks during storage of fuel: • All equipment used to store or dispense fuel will be free of leaks. • Fuel storage locations and equipment will be inspected according to a developed inspection program. Fuel storage locations will be visually inspected daily for leaks, spills, and obvious abnormal conditions. Any leakage will be repaired immediately. If tanks are resting on the ground, daily measurements of fuel levels by tank dip and calculation of fuel gain or loss will be taken. • Tanks will be physically protected from collision. • All tanks will be regularly serviced. • Tanks will be filled to an acceptable safe filling level of approximately 90% capacity (MWLAP 2002).
	Fuels will be stored separately from corrosive materials.
	Smoking in and around fuel storage and fuel dispensing facilities will be prohibited. Signage will be placed adjacent to all such locations.
	When not in use, Mobile fuel storage trucks will be parked in designated locations and in a manner to prevent spills and avoid risks of collisions.
	A fuel cache with more than four drums should be contained within a secondary containment.
	Tank supports will have a fire-resistance rating of at least 2 hours.
	Fuel storage and dispensing will occur at least 30 m from watercourses and wetlands.
Storage and Inventory Control *(cont'd)*	Any tank that will be out of service for more than 180 days must have all liquid and vapour removed from the tank and its connected piping, isolated by closing and locking valves or pipping from the tank, and the contents shipped to an appropriate facility for storage or use. The tank must also be clearly marked by signs to indicate they are empty.
	Liquid levels in tanks containing flammable or combustible liquids will be measured at intervals no greater than one month.

Topic/ Activity	Mitigation/Management Measures
Handling and Dispensing	At the Bulk Fuel and Ready Line and larger temporary fuel tanks, fuel will be dispensed directly from tanks to haul trucks and fuel -transport trucks by means of high-flow (Wiggins-type) nozzles and receivers.
	Fuel transfer trucks will deliver fuel to mobile equipment, and to various other smaller, temporary tanks at various locations on Site.
	Fixed fuel dispensers will be physically protected from collision damage by concrete barriers (> 10 cm high) or guard rails BC Fire Code 4.5.3.3).
	All operators will remain with the fuel nozzle while refueling.
	Ignition will be turned off while the vehicle is being refueled.
	Two approved and current 20 lb BC fire extinguishers will be available within 9 metres of the work area while handling fuel (BC Fire Code Section 4.6.9.1).
	At least one approved and current 20 lb portable fire extinguisher within the tank vehicle (BC Fire Code Section 4.11.2.1).
	Prevent tanks from being overfilled by providing continuous supervision of the filling operation by personnel qualified to supervise such an operation; **or**, an overfill protection devise conforming to ULC/ORD-C58.15 (BC Fire Code 4.3.1.8).
	Fuel loading procedures must be posted at the fueling site and reviewed with all personnel.
	After refueling, hose and nozzle and will be stored in a secure and safe position to prevent unnecessary spillage. Hoses will be kept off the ground and valves closed and locked when not in use.
	Do not fuel or service equipment within a riparian management area of a stream or wetland, or within 30 m of a shoreline.
	Complete visual inspections of the piping system, pumps and ancillary equipment for leaks spills and obvious abnormal conditions.
	All transfers from tanker trucks to tanks at remote fueling stations will be done using enclosed lines, hoses, and pumps.
	All storage and transfer locations will also be equipped with appropriate spill kits.
	Fuel transfer procedures will include best management steps to ensure no overtopping of tanks or spillage. In addition, inventories will be tracked regularly to check on any possible losses. All spills or accidents will be reported immediately.
Inspections and Preventive Maintenance	Stationary fuel and dispensing stations, generator facility and fuel storage areas will be visually inspected and documented based on the type of tank and associated piping in accordance with Section 4.4 of the BC Fire Code.
	Reporting and record keeping will be in accordance with Section 12 of the FMSCP.

Note: FMSCP = Fuel Management and Spill Control Plan

10.1 Spill Response

Spill response measures shall be in accordance with the FMSCP and additional response is provided through provisions of the MERP. Table 10.1-1 identifies spill reporting thresholds. The following immediate response actions will be implemented in the event of a spill of fuels, oils, lubricants, or other harmful substances:

1. Make the area safe – identify the substance, evaluate immediate risk and warn personnel in the vicinity of the spill.
2. Stop the flow (when possible and safe).

Table 10.1-1: Spill Reporting Thresholds and Requirements

Substance	Quantity	Regulatory External Reporting Requirements*	BW Gold Reporting Requirements[1]
Any Spill	Any amount in aquatic habitat	Emergency Management BC (EMBC), DFO and ENV	Environmental Incident Report (EIR)
Fuel and Oil	≥ 100 litres	EMBC	EIR
	Any amount off property	ENV and local authority	EIR
Flammable or Non-Flammable Gas	≥ 10 kilograms	EMBC	EIR
Toxic or Corrosive Waste	≥ 5 litres or kilograms	EMBC	EIR
Hazardous Waste	≥ 5 litres or kilograms	EMBC	EIR
Explosives	Any quantity that could pose a danger to the public, or ≥ 50 kilograms	EMBC	EIR

** Notification processes to other parties for environmental incidents is outlined in the Accidents and Malfunctions Administration and Communications Plan.*

10.2 Spill Reporting Contact Numbers

Not all contact numbers provided in Table 10.2-1 require notification for a particular spill. These numbers are intended to be a quick reference for the EPCM Contactor and EM who will determine the appropriate calls to make based on the particular spill's requirements. Other contact numbers may be added to this table for reference as needed.

Table 10.2-1: Spill Reporting Contact Numbers

Contact	Phone Number
Mine Manager (or delegate)	TBD
Environmental Department	TBD
Environmental Monitor	TBD
Chief Inspector of Mines	250-952-0494

Deputy Chief Inspector of Mines	250-952-0471
BC Wildfire: • Phone • Cell	 250 565 6124 *5555
Conservation Office – Vanderhoof	250 567 6304
Emergency Management BC	1 800 663 3456
WorkSafe BC: • General • After Hours	 1 888 621 7233 1 866 922 4357
Poison Control	911
Spills - BC Environment	1 800 663 3456
Department of Fisheries and Oceans (Prince George)	250-627-3499

Note: TBD = to be determined.

10.3 Spill Response Equipment

These supplies and equipment are to be used only for their intended purpose. Under no circumstances will emergency supplies be used in non-emergency situations. Spill response equipment will be located at sites where fuels, oil, cyanide, and other hazardous materials are stored. They are maintained, inspected, and replenished so that they are available for immediate use. Any equipment or materials used during a spill will be replaced within 48 hours following a spill, with back-up ordered within 2 weeks. A review and inspection program has been developed and will be applied in accordance with the FMSCP.

The Health and Safety Manager or their designate will inspect and maintain the emergency supplies. The inspection will be documented, and records retained.

Heavy equipment resources available at the Mine Site to control, contain, and clean up spills include:

- Rock/haul trucks;
- Dozers;
- Front-end loaders;
- Motor graders;
- Excavators; and
- Pumps and storage vessels.

BW Gold's fuel trucks and light duty vehicles that travel the surface mine roads will be equipped with materials to provide preliminary response to a spill. Operators of the vehicles will be responsible for maintenance of the spill kits. Examples of items in spill kits are as follows:

- 25 absorbency pads;
- 13 L bag of Oclansorb;
- 4 large plastic garbage bags;
- 1 roll heavy gauge poly for containment;

- 1 shovel;
- 1 Pulaski;
- 2 plugs for burst gas tank or oil drum;
- 1 Watergate® barrier; and
- Although employees will be wearing basic site personal protective equipment (PPE), additional PPE will be included in the vehicle spill kits, such as extra gloves and safety goggles.

There are spill kits located in close proximity to storage areas containing hazardous materials. The spill kits will be easily accessible. Examples of what these kits may contain are:

- 50 absorbency pads;
- 4 of 4"×10' sorbent socks for booming;
- 1 container of plugging compound for sealing tanks or drums;
- Box of Large plastic garbage bags;
- Box of vinyl gloves; and
- Plastic container to store used absorbents.

Disposal of used items is to be coordinated with the warehouse. Additional abatement materials are located at the warehouse.

10.4 Petroleum Tanks

Petroleum products will be used at all Project locations and minor to significant spills may occur at any mine site area. To reduce the risk of a spill, site fuel tanks will be built and installed to comply with all regulatory requirements and relevant guidelines, including the Field Guide to Fuel Handling, Transportation and Storage (BC MWLAP 2002). All storage vessels will be double-walled. Permanent storage vessels greater than 75,000 L will be located within a secondary containment, and be equipped with oil/water separator and high-level alarms.

10.5 Dangerous Goods and Hazardous Materials

The proper storage and handling procedures described in the Chemicals and Materials Storage, Transfer, and Handling Plan will be followed to minimize the risk of spills of chemicals and materials.
Hazardous materials will be clearly labelled and stored in proper containers in secure locations, where they will be accessed by trained personnel only. Secondary containment will restrict the spread of any spilled product and conveniently located Safety Data Sheet and spill kits will facilitate safe and timely cleanup.

10.6 Effectiveness Monitoring

Post-spill evaluation, monitoring and remediation requirements are provided in Section 11 of the FMSCP.

11.0 Emergency Response

An Emergency Response Team (ERT) has been assembled from Project personnel to implement the MERP, organized and led by the Health and Safety Manager. It outlines the responsibilities and duties of the Emergency Response Team in the event of an emergency. The ERT will receive training in:

- Incident Command System;
- Communication protocol;
- First aid;
- Firefighting;
- Rescue techniques; and
- Hazardous material handling and clean up.

The MERP covers all of the Project facilities and work areas, is applicable to all Project phases, and will be activated if a Project-related emergency and/or relevant incident occurs.

12.0 Project Orientation

Training and communication are essential to the successful application of the CEMP. All Project site personnel are expected to understand the CEMP's primary objectives and key mitigation measures, and their responsibilities in order to successfully implement the plan. Relevant site personnel (i.e., management and supervisors) are expected to have a comprehensive understanding of the CEMP and its requirements as it relates to their job function. Other personnel are expected to have a basic understanding of the CEMP, with knowledge specific to their job function.

To achieve broad awareness of this CEMP, all mine-site personnel must attend a one-time orientation session upon arrival at the Project site that includes site-specific safety and environmental components. Orientation materials specific to the environment will be prepared by BW Gold, and delivery of the orientation sessions will be a collaboration between BW Gold staff and the EPCM contractor's Environment, Health and Safety Representatives. Refresher training intervals for site on-boarding are to be determined, however, regular crew tailgate meetings, earthworks weekly meetings and management daily meetings will cover the relevant seasonal aspects of the topics below as a result of on-site observations, seasonal risks and throughout an annual period.

Personnel must sign and date the orientation record confirming that they have received the indoctrination materials and presentation. Signed environmental orientation meeting records must be provided to the HSE Department designate and retained on record as required by the Code. From an environmental perspective, the orientation will include but not be limited to the following topics:

- CEMP and Management Plan orientation;
- MERP orientation;
- Access road use and haulage operating protocols;
- Restricted access and recreation rules;
- No hunting / no fishing policy;
- Wildlife observation and interaction reporting procedures;
- Caribou awareness program;
- Bear awareness program;
- Whitebark pine awareness;
- Fish habitat and wetland awareness;
- Waste management procedures;
- Wildlife-human interaction procedures including management of wildlife attractants;
- Wildlife sensitive locations/timing as applicable;
- Hazardous material management;
- Onsite waste procedures;
- Erosion prevention and sediment control;
- Soil conservation awareness;
- Best management practices for working in environmentally sensitive areas;
- Chance Find Procedure; and
- Emergency procedures including spill response and incident reporting.

Refresher training will be provided to all employees following a significant incident warranting refresher training to all staff. Additional site- and task-specific training will be provided to site workers as required.

13.0 Timing and Pre-construction Planning

A critical element in minimizing impacts on environmental features while advancing construction is coordination between the construction schedule, wildlife restriction periods, pre-clearing surveys, and planning for mitigation measure implementation. Contractors will be required to provide accurate and timely construction and mobilization schedules in advance of work so that pre-clearing surveys, if required, can be carried out and the findings incorporated into construction planning. Contractors will be required to furnish BW Gold with these materials several months ahead of construction. In addition, routine day-to-day scheduling coordination between contractors, BW Gold staff, and Environmental Monitors will be required.

A mechanism for posting and distributing live schedules will be established.

13.1 Fish and Wildlife Restriction Periods

Timing restriction periods exist for certain fish and wildlife species that require management during construction activities. These periods, and associated mitigation activities for the selected fish and wildlife species are summarized in Table 13.1-1. The table includes timing restrictions from the following sources:

- Federal and provincial legislation;
- Commitments recorded in the Blackwater Mitigation Table submitted to the BC Environmental Assessment Office in accordance with Condition #43 of the EAC;
- The federal DS;
- Mitigation measures associated with pre-construction surveys recorded in Condition #23 of the EAC; and
- BC guidelines and BMPs, including:
  - *A Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia* (BC FLNRO 2014);
  - *Best Management Practices for Amphibian and Reptile Salvages in British Columbia. BC Ministry of Forests, Lands and Natural Resource Operations* (BC FLNRO 2016);
  - *Best Management Practices for Bats in British Columbia* (BC MOE 2016);
  - *General Nesting Periods of Migratory Birds (*ECCC 2017);
  - Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in *British Columbia* (BC MOE & BC FLNRO 2014);
  - *Guidelines to Reduce Risk to Migratory Birds* (ECCC. 2019);
  - *Management Plan for the Western Toad (*Anaxyrus boreas*) in Canada* [Proposed]. Environment and Climate Change Canada: Ottawa (ECCC 2016);
  - *Nesting Calendar Query Tool* (Birds Canada. 2021); and
  - Terms and Conditions for changes in and about a stream specified by MWLAP Habitat Officers, Omineca Region (FLNRO 2004).

The provincial commitments on pre-clearing for furbearers requires adherence to the Compendium of Wildlife Guidelines (BC FLNRO 2014) which does not indicate sensitive time periods for beavers.

However, beaver lodges are protected under the *Wildlife Act* and removal of a beaver lodge requires a permit. The BC Code of Practice states that alteration or removal of a beaver dam is permitted under the *Wildlife Act* "to provide irrigation or drainage under lawful authority for the protection of property" and under the *Water Act* for drainage purposes with specific restrictions. Therefore beaver dams less than one year old on a constructed ditch may be removed by a landowner as required (https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/water/drainage-management-guide/543110-1_beaver_dam_management-drainage_guide_factsheet_no16.pdf). If a beaver lodge is identified, it will be reported to the EM and a site-specific management plan will be developed and implemented. The site specific management plan would also conform with the DFO Code of Practice for beaver dam removal (https://www.dfo-mpo.gc.ca/pnw-ppe/codes/beaver-dam-barrage-castor-eng.html).

13.2 Pre-Construction Surveys

Project construction activities that may disturb wildlife (e.g., vegetation clearing), will be avoided during activity restriction periods wherever possible (Table 13.1-1). If avoidance is not possible during these periods, pre-construction surveys will be conducted in accordance with EAC Condition #23 and the WMMP to identify features that must be avoided and mitigation measures implemented. Pre-construction surveys will be completed under the direction of qualified registered professionals.

The site Environmental Monitor will be familiar with pre-construction survey requirements and management plans which may require pre-construction surveys, and ensure that construction scheduling incorporates sufficient lead time for qualified registered professionals to complete surveys.

Surveys will be specific to the season using species-specific survey methods to locate nests. The Environmental Monitor will keep a log of when pre-construction surveys were conducted and the results, including a log of all mitigation actions applied. These include set-backs established around habitat features such as dens and nests.

Table 13.1-1: Timing Windows for Fish and Wildlife Species during Construction

Valued Component	Specified Period	Season/ Habitat for Feature	Summary of Mitigation	Guideline Buffers (m)	References
Rainbow trout	Jul 15 - Apr 15	All Watercourses	• No in-water work (includes within the high-water mark of all water bodies: watercourses, lakes, wetlands etc.)	30 m	*Fisheries Act* *Water Sustainability Act* BC FLNRO 2004
Amphibians: Western Toad	Apr 1 – Sep 30	Wetlands (breeding sites)	• If clearing is required during the breeding season, conduct pre-construction surveys to identify breeding sites, and pre-clearing surveys to confirm occupancy • Establish buffer zones around breeding sites • Amphibian salvage will be conducted if necessary, in consultation with ECCC and Indigenous groups	30 m	BC MOE & BC FLNRO 2014; ECCC 2016; BC FLNRO 2016
Bats: Little Brown Myotis and Northern Myotis	Roosts: May 15 – Sep 30 Hibernacula: Oct 1 – May 31	Roosts (summer), Hibernacula (winter)	• Pre-construction surveys to determine the distribution of little brown myotis and northern myotis • Establish buffer zones around active hibernacula and active roosts • Contact MOF if Project activities will occur within a roost buffer • Monitor buffer zones for ongoing use • If surveys identify loss of little brown myotis and northern myotis roosting habitat, implement offsetting through roosting structures maintained until natural roosting habitat is restored	100 m – up to 1 km management zones for blasting near significant roosts/ hibernacula	BC FLNRO 2014; Holroyd and Craig 2016
Birds: Forest and Grassland Birds, and Waterbirds	Apr 15 – Aug 31 Clark's Nutcracker: Mar 15 – Jul 30	Nests, eggs, and young	• Pre-construction surveys for habitat of species at risk • If clearing required during breeding bird window, conduct pre-clearing surveys for bird nests • surveys will include habitat considerations and protocols for species at risk • Establish buffer zones around active nests	30 m - 100 m	ECCC 2017, 2019; Birds Canada 2021

Valued Component	Specified Period	Season/ Habitat for Feature	Summary of Mitigation	Guideline Buffers (m)	References
Raptors	Mar 15 – Aug 15	Nests, eggs, and young	• If clearing required during raptor breeding window, conduct pre-clearing surveys to identify raptor nests in suitable habitat: mature forest, riparian, or cliff areas • Establish buffer zones around active nests • Apply for permits to remove or relocate unoccupied nests if necessary	100 m – 500 m	BC *Wildlife Act* 1996b BC MOE 2013; Birds Canada 2021
Caribou and Mountain Goats	Jan 15 – Jul 15	Ungulate Winter Range	• Conduct pre-construction surveys for caribou and goat habitat, including trails and mineral licks • Observations of caribou on the mine site during construction may result in a work stoppage until the caribou moves off; see the Caribou Mitigation and Monitoring Plan for management details • No active deterrence of goats or caribou is permitted unless animals are in a location that is dangerous • Aircraft minimum altitude 400 m in the UWR	-	BC FLNRO 2014
Furbearers	Fisher: Mar 15 – Jun 30 American marten: March 1 – Sept 30 Wolverine: Feb 1 – Jun 30 Black and Grizzly Bear: Oct 1 – Apr 15	Dens	• If clearing required during denning period, conduct pre-construction surveys for denning habitat of: – American marten – Fisher – Grizzly bear – Black bear – Wolverine • Establish buffer zones around denning features, including suitable denning habitat for fisher or marten denning, although dens will not be individually identified	60 m (Grizzly and Black Bear) – 500 m (Wolverine)	BC FLNRO 2014

14.0 Project Meetings

14.1 Kickoff Meetings

At the start of construction, including prior to starting clearing, construction, or mobilization of a new area, a kickoff meeting will be held to review and discuss the scope and timing of activity. This is normally accomplished at the weekly earthworks meeting and any highlights often communicated through the daily management meeting. The meeting(s) will confirm working relationships and communication protocols, awareness of regulatory requirements, environmental sensitivities, mitigation measures, pre-clearing survey requirements, personnel and resource needs, agency notifications/permit conditions, schedule constraints and risks, hazard review, and safety performance. Key regulatory permits, approvals, CEMP requirements, and mitigation measures are reviewed and documented as required. A key outcome of the aforementioned meetings is confirmation of environmental monitoring resources needs and to confirm the work has been planned effectively to avoid foreseeable environmental impacts.

Contractors are responsible for ensuring that their personnel and sub-contractors are appropriately trained and competent to implement the requirements of the CEMP and relevant management plans. Contractors shall ensure attendance of their personnel at kickoff meetings and tailgate meetings. The Environmental Monitor will provide additional and site-specific environmental information and background at Progress Meetings, crew Tailgate Meetings (where applicable), and through the submission of electronic safety shares. The Environmental Monitor will also be on site in the field during construction activities to raise awareness and understanding of environmental matters.

14.2 Progress Meetings

Regular Progress Meetings (e.g weekly earthworks meetings) will be held monthly during Major Works construction, chaired by the BW Gold Construction Manager, and will include representation from all relevant parties including the EM and, when their site visits coincide with the monthly meeting, the Independent Environmental Monitor. The environmental portion of these meetings will include, at a minimum, the following:

- A review of recent activities, and a discussion of any environmental concerns that should be communicated to the group;
- Identification of seasonal changes that will affect construction planning (e.g., activity restriction timing);
- Detailed review of any recent incidents, investigation findings and follow-up actions;
- An overview of upcoming work planned, and schedules;
- Review of contractors/personnel on-site or coming to site and associated training requirements; and
- Communication of any updates/revisions to the CEMP.

14.3 Tailgate Meetings

Daily Tailgate Meetings at the crew level will be held to provide instruction in safety, environmental awareness, and task assignment. Tailgate Meetings will include a safety and environmental briefing, an overview or update regarding environmental sensitivities at a site that may be affected by construction activities, planned activities and map review, and awareness of mitigation measures/boundaries/working area and communication protocols from the relevant BW Gold departmental supervisor or the EPCM Contractor’s Site Supervisor or Superintendent(s). Tailgate meetings, including content pertaining to

environmental management and protection, will be documented by each BW Gold department and each EPC contractor. Electronic safety shares and daily management meetings are used to share key environmental information with site crews.

Should conditions change during the course of daily work at a construction site such that environmental risks increase (e.g., heavy rainfall and increased risk of sediment and erosion problems affecting adjacent watercourse), then crews are expected to respond, and address environmental risks and mitigation due to changing conditions.

15.0 Monitoring Program

Successful implementation of the CEMP will require an ongoing process of monitoring, reassessment, and modification. At its most fundamental level, a successful monitoring program involves all site personnel. Keeping personnel trained and informed of the goals and purpose of the CEMP promotes a conscientious approach to environmental management. Site personnel will be properly equipped with the appropriate training and tools, and will fully understand their individual responsibility in implementing the CEMP. These “informal” inspections by all personnel are augmented by formal, regularly scheduled inspections performed by the Environmental Monitor or qualified registered professional. At a minimum, there will be one full-time Environmental Monitor on site during construction. The Environmental Monitor will focus on site-wide construction monitoring activities in accordance with the CEMP. The frequency of monitoring will be based on the level of risk. For example, the Environmental Monitor will monitor high-risk activities, such as watercourse crossings, at an hourly/daily frequency during the activity. Lower-risk activities, such as gravel placement for a roadway, will be subject to weekly monitoring. The EM will work with the Environmental Manager to determine daily and weekly monitoring priorities based on construction activities. The Environmental Monitor will be supported by subject matter experts as required.

Accurate, detailed, and standardized records will be kept throughout the monitoring program to support status reporting to Project management, regulatory agencies, and stakeholders.

15.1 Traffic and Access Monitoring

Ongoing informal monitoring on a continual basis by Site Security will be conducted to track traffic and access related mitigation measures on all Mine Site roads, including the MAR in accordance with the MSTCP. Traffic and Access monitoring during construction will include:

- Tracking of road safety incidents, including wildlife interactions/collisions, to determine trends and identify areas requiring further mitigation;
- Monitoring the effectiveness of animal escape way breaks in snow clearing banks;
- Monitoring unauthorized development of snowmobile trailer pullouts;
- Monitor and record unauthorized ATV access to mine site;
- Record incidental observations of wildlife locations;
- Record general observations of wildlife occurrence; and
- Record the amount and nature of traffic use by BW Gold and its Contractors.

Access to the Mine Site is controlled via the security checkpoint on the MAR, which is staffed by Site Security.

15.2 Metal Leaching/Acid Rock Drainage Monitoring

During the Construction phase ML/ARD monitoring will be undertaken in accordance with the ML/ARD Management Plan. Inorganic overburden will be monitored by collecting composite samples from test pits or active excavation areas as it is being excavated. One composite overburden sample is to be collected for every 25,000 m^3 of material disturbed and analyzed at the onsite laboratory. A minimum of two well-spaced samples collected from each distinct Project component (e.g., plant site) where excavation of overburden amounts to < 50,000 m^3. An SOP for overburden sampling is provided as Appendix C.

15.3 Soils Monitoring

Soil monitoring will be conducted in accordance with the Soil Management Plan. At a minimum monitoring will include:

- **Salvage** – Daily visual inspections will be conducted during stripping to confirm that (1) weather and soil moisture conditions are appropriate for salvage, (2) all target reclamation material is being salvaged, as practical, (3) suitability criteria defined in are being applied, (4) target salvage depths are being achieved, and (5) reclamation materials are being appropriately segregated. If, during salvage operations, greater than 15% of surficial soils are inaccessible due to steep slopes[2], then the reclamation materials balance will be reviewed to confirm that adequate volumes of each surface soil type are still available to meet reclamation material needs. Salvage plans (e.g., areas, depths, and/or suitability criteria) may need to be adjusted accordingly.
- **Sampling** – Sampling of salvaged reclamation materials will be conducted during salvage and/or application as per SMP Section 9.1.5 (surface soils) and SMP Section 9.2.2 (overburden) to confirm material properties and suitability for reclamation.
- **Stockpiling** – Weekly stockpile development inspections (including consideration of foundation, layout, slope, and lift height) and completion inspections of the final structure, as well as supplemental inspections as required for erosion monitoring will be conducted. Stockpile volume and location tracking will be carried out during salvage and stockpile operations as described in SMP Section 10.3. Along with volume tracking, the reclamation materials balance will need to be reviewed to confirm the availability and suitability of reclamation materials aligns with mapped polygons and verify the accuracy of the projected reclamation materials balance.
- **Stockpile inspections** – Semi-annual inspections of stockpiles in spring and fall will be conducted to assess re-vegetation status, presence of invasive or non-desirable species and evidence of erosion. Presence of identification signage will also be confirmed. Stockpiles will also be inspected after significant rainfall events (as defined in the SMP).
- Confirmation identification signage is in place.
- Any additional monitoring requirements identified by the EPCM contractor.

Erosion and sediment control monitoring is presented in the SEPSCP including monitoring locations and frequencies.

15.3.1 Supervision by a Qualified Registered Professional

A qualified registered professional who has appropriate training for delineating operationally salvageable areas and surface soil suitable for salvage will be remotely monitoring salvage operations with data being provided to them by the BW Gold project engineers on a regular interval. The QRP will be required to mobilize to site for periodic visits to ensure soils to be salvaged have been clearly marked and/or communicated to operators all salvageable areas and areas that should be avoided during salvage (e.g., areas with exposed bedrock that are expected to have shallow soils). Qualified registered professionals will be responsible for reviewing the designation of the parent-material type of salvaged surface soil (i.e., glaciofluvial, mixed -mineral or organic) and the corresponding appropriate salvage depths and segregation outlined in the field by construction supervisors. They will be remotely monitoring salvage operations to verify compliance with the SMP and to review soil samples analysis of

[2] Or due to unanticipated unsalvageable conditions, such as bedrock or water areas that were not classified as such in the terrain polygons delineated at baseline.

recently- stockpiled surface soil during salvage operations to confirm that the properties of salvaged surface soils meet suitability criteria.

15.3.2 Effectiveness Monitoring

The TARP associated with soils monitoring is provided in Table 9.1-3 of the Soil Management Plan.

15.4 Chemicals and Material Storage and Handling Monitoring

Weekly inspection of facilities for dangerous goods and hazardous materials will be implemented during construction in accordance with the CMSTHP (including the Cyanide Management Plan). Facilities will include relevant aboveground tanks, pipelines, connections, valves, gauges and meters, sumps and separators, secondary containment if relevant and inventory records. In general, inspections will include:

- Inspection of all permanent and temporary chemical (including fuel) storage facilities;
- Inspection for proper segregation, storage, and disposal practices; and
- Inspection of spill kits and available protective equipment for spill response.

15.5 Air Quality Monitoring

An EMA Air Discharge permit will be in effect for the mine site and will provide air quality monitoring conditions, including fugitive dust that is typical of a construction and operating mine site. An air quality monitoring program has been developed as part of the Air Quality and Dust Management Plan, which may require updating to satisfy permit conditions.

15.5.1 Meteorological Monitoring

Meteorological conditions are an important consideration when assessing air quality as they may contribute to windblown dust and will influence the behaviour of emissions following release.
This information is also important in ongoing updating of site climate baseline and understanding water balance. Site specific continuous meteorological monitoring is expected to be maintained throughout the Construction phase of the Project. Information from the on-site stations will be used in analysis and evaluation of fugitive dust monitoring described above.

There are two on-site meteorological stations. The details of each station, including the monitored parameters, are presented in Table 15.5-1.

Table 15.5-1: Meteorological Stations at Blackwater Mine

Station Name	Station Height	Latitude (º North)	Longitude (º West)	Elevation	Meteorological Parameters Monitored	Data Period Available
Low	10 m	53.29979	124.80025	1,050 masl	Air temperature, relative humidity, precipitation, wind speed and direction, barometric pressure, snow depth, net radiation, solar radiation	August 2011 to present

Station Name	Station Height	Latitude (º North)	Longitude (º West)	Elevation	Meteorological Parameters Monitored	Data Period Available
High	10 m	53.18113	124.84620	1,470 masl	Air temperature, relative humidity, precipitation, wind speed and direction, barometric pressure, snow depth, net radiation, solar radiation	July 2012 to present

Notes:

m = metres; masl = metres above sea level

15.5.2 Dustfall Monitoring

According to ENV 2020, dustfall monitoring and the dustfall Pollution Control Objectives have outdated methodology and criteria, and are no longer recommended by BC ENV. Therefore, visual monitoring of dust will be undertaken.

Mine personnel will be trained to be observant for dust related concerns which may arise as defined in the Fugitive Dust Management SOP. These observations, together with meteorological conditions and mitigation efforts taken to deal with a problem, will be recorded and included in monthly and annual reports. Visual monitoring will focus on areas where there are active surface earthworks, haul roads and overburden and soil stockpiles. Visual monitoring will occur on a daily basis at all locations where fugitive dust generation is occurring.

15.5.3 Particulate Matter Monitoring

A Partisol sampler will be installed on the mine site at the exploration camp before the start of major works construction, and moved to the operations camp at the start of operations. The station will measure PM < 10 microns (PM_{10}) and PM < 2.5 microns ($PM_{2.5}$) mass concentrations on a 47 mm filter contained in a single-action filter change mechanism.

Samples will be collected over a 24-hour period at a target flow rate of 1 m^3/h. Sample volumes will be recorded and divided into the mass concentration to yield a 24-hour average concentration in units of µg/m^3. The Partisol sampler is suitable for a wide variety of climate conditions and meets the United States Environmental Protection Agency guidelines for manual air samplers.

Fine particulate sampling will occur every third day, alternating between $PM_{2.5}$ and PM_{10}, between May and October. During winter conditions, sampling frequency will be weekly.

15.5.4 Nitrogen Dioxide and Sulfur Dioxide Monitoring

Nitrogen dioxide and sulphur dioxide will be sampled using a passive air sampling system (PASS) whereby gas pollutants are monitored by passive diffusion through a diffusive surface onto an adsorbent membrane or filter. PASS monitors are installed at the exploration camp works construction and will be installed at the operations camp at the start of operations.

Monitors will be under a protective rain shelter, attached to a supporting pole. Site personnel will collect and replace the PASS units approximately every 30 days, and submit the units to an accredited laboratory for analysis.

PASS laboratory results will be reviewed for sample integrity issues and erroneous data. Field notes, chains of custody, comments from the laboratory, and professional judgement will also be considered during the review process. Invalid data will be omitted from final analyzed datasets. Because PASS sampling is passive, hourly nitrogen dioxide and sulphur dioxide concentrations cannot be sampled using this method and therefore will not be compared against the hourly Canadian Ambient Air Quality Standards.

15.6 Water Quality Monitoring

15.6.1 Erosion and Sediment Control Monitoring

A performance-based approach will be used to assess the effectiveness of erosion and sediment controls and drainage control. Monitoring will occur at minimum weekly during spring freshet and monthly outside of freshet and in open water periods, as well as after each significant melt event or runoff-producing rainfall event.

The TARP provided in Table 9-2 of the SEPSCP will be implemented for managing significant rainfall events and for works in and around water to plan appropriate actions used in response to observed changes in environmental conditions that are approaching or exceeding management objectives. Effectiveness will be determined by the extent to which certain performance metrics are being achieved. During instream works or after a significant rainfall event, the Environmental Monitor will sample at a frequency determined by the TARP provided in Table 9-2 of the SEPSCP.

A receiving water target, determined at the discretion of the environmental monitor, applies downstream of a construction site, in the water body to which the site drains.

Total suspended solids (TSS) is the parameter typically measured to assess effectiveness of ESC measures; determination of TSS requires collection of a water quality sample and analysis at an accredited laboratory. Water turbidity is often measured and used as a proxy for TSS, since *in situ* turbidity can be measured onsite with a handheld turbidity meter (in nephelometric turbidity units (NTUs). The federal water quality guidelines for turbidity are extrapolated from the suspended sediment guidelines of a 25 mg/L and 5 mg/L change from background for short-term and long-term exposures, respectively, according to the suspended sediment and the general turbidity correlation of 3 to 1 (CCME 2002).

Because duration of exposure to elevated TSS and turbidity is a key factor in assessing aquatic impacts, as shown in Table 15.6-1, targets for construction runoff and downstream receivers will be an induced change in turbidity levels, in order to implement any needed corrective measures in a timely manner.

During all required inspections detailed above, if turbidity levels are observed to appear to be exceeding the induced change from 8 NTUs for a duration exceeding 24 hours, a water sample will be collected and submitted for laboratory analysis of TSS. A background water sample will be collected in the receiving watercourse upstream of construction runoff and downstream of the construction area during the same sampling event, in order to determine the change from background. During construction activities near water, “background” for the purpose of TSS and turbidity monitoring, will be based on water samples collected in a receiving stream upstream of the construction area.

The monitoring frequency will depend on site conditions: an increase in contaminant concentrations in construction runoff in the receiving environment may trigger changes in the monitoring program (e.g., increased monitoring frequency, additional monitoring stations in the receiving waterbody both upstream (background) and downstream of the construction area) to identify sources and the requirement for additional BMPs.

Table 15.6-1: Monitoring Triggers – Maximum Allowable Increase of TSS and Turbidity

Parameter	Background		
	Clear Waters	**Turbid Waters**	
	(TSS <25 mg/L Turbidity <8-NTU)	**(TSS 25-100 mg/L Turbidity 8-50 NTU)**	**(TSS >100 mg/L Turbidity >50 NTU)**
Total Suspended Solids (TSS)	• Change from background of 25 mg/L at any one time for a duration of 24 hours • Change from background of 5 mg/L at any one time for a duration of 30 days	• Change of background of 10 mg/L at any time	• Change from background of 10%
Turbidity	• Change from background of 8 NTU at any one time for a duration of 24 hours • Change from background of 2 NTU at any one time for a duration of 30 days	• Change of background of 5 NTU at any time	• Change from background of 10%

In the event that a measurement is over the target listed in Table 15.6-1, a preliminary investigation will take place to confirm whether the exceedance is valid (e.g., not simply a result of passing debris or beaver damming activity) and whether the construction site itself is the source of elevated turbidity measurements. BW Gold will engage suitably qualified individuals (if and where required) to supervise the construction activities, who will determine the validity of a result deemed and whether it results from construction or other external factors. These actions are detailed in EMA permit 110652 – Conditions 3.4 Trigger Response Plan for Authorized Discharges to Davidson Creek, Condition 3.6 Erosion and Sediment Control Plan and Conditions 6.1 – 6.3 Non-Compliance Reporting Should a measurement exceed a trigger, the Environmental Monitor will visually inspect the construction area to evaluate if the result is reasonably being caused by construction activities. If it is, then the actions in the TARP will be triggered without delay. If, however, the Environmental Monitor visually determines that the construction activities are not reasonably the cause of an exceedance, then the Environmental Monitor will implement other validation techniques to ascertain the source of the exceedance. This would include further field-truthing upstream of the construction area to understand if a natural slide event, for instance, has caused the exceedance. Also, calibration of the *in situ* monitoring instrument(s) would be undertaken.
The clarification above outlines how the Environmental Monitor will use their experience to immediately undertake these validation techniques to ascertain the necessity to stop work and protect the receiving environment should there be trigger exceedances caused by the construction activities.

If the elevated turbidity level is valid and is a result of construction activities, the Environmental Monitor will inform the Project Engineer or EM, who shall cease all work that may have a direct or indirect impact on water quality, and immediately initiate additional mitigation actions. Upon confirmation of the exceedance, a preliminary notification will be sent out to relevant parties (e.g., Construction Manager) at the earliest safe opportunity to do so. The notification will include:

- Date and time of inspection;
- Site location information;
- Timing, location, magnitude, and duration of turbidity exceedance;
- Any information about suspected source of sediment;

- Description of the repairs, maintenance and/or modifications of ESC measures planned in order to address the elevated sediment releases causing turbidity exceedances; and
- Estimated timing for the completion of repairs, maintenance and/or modifications.

In the event that turbidity exceedances continue despite initial efforts to rectify ESC deficiencies, update reports will be sent to the relevant parties at an agreed upon frequency until turbidity falls back below the applicable target.

Depending on the site of the exceedance, the nature of the construction work, and the magnitude and duration of the exceedance, stop work orders may be issued if on-going exceedances are not rectified in a timely manner.

15.6.2 Mine Site Water Quality Monitoring

The mine site water quality monitoring program includes the evaluation of the quality of contact water and non-contact water that has been diverted around the mine site or captured for use in the mill process (MSDP, Table 7.3-1). Monitoring will be completed during construction and operations on a monthly basis for parameters and sites indicated in Table 7.3-2 of the MSDP. Parameters to be monitored include constituents recommended by the BC MOE (2016) as well as parameters identified as Parameters of Concern and Parameters of Potential Concern.

Mine site water quality monitoring also includes groundwater with the establishment of groundwater wells at 29 locations to monitor groundwater quality and at 40 locations to monitor groundwater flow (see MSDP, Table 7.3.5 and Table 7.3-6). Monitoring of water levels and water quality at groundwater discharge points will assist in characterizing potential for impacts to surface water from groundwater. Seep surveys will also be completed to understand groundwater flow in the Project area and specifically down-gradient of the TSF, and stockpiles, to identify potential pathways for seepage from these facilities. Seep monitoring will include descriptions of seeps and waterbodies encountered during mapping, their frequency and location, elevation, and water quality.

Data analysis will include an evaluation of concentration trends and comparison to trigger levels identified in Section 9.3.2 (MSDP, Table 10-1) and events triggering adaptive management actions (MSDP, Table 11-1).

15.6.3 Receiving Environment Water Quality Monitoring

The AEMP has been developed for aquatic receiving environment monitoring. Surface water quality monitoring at receiving water quality monitoring stations identified in the AEMP, Table 4.2-1) will be conducted during the Construction phase to assess Project-related effects on surface water quality. The AEMP will be conducted on an annual basis beginning the first year of Construction, with monitoring frequency (monthly, weekly, or quarterly) at each of the sampling locations identified in Table 4.2-2 of the AEMP.

Data analysis and reporting will focus on the Parameters of Concern and Parameters of Potential Concern for the Project, in addition to the constituents with available BC and federal water quality guidelines for the protection of aquatic life, approved science based environmental benchmarks or water quality standards. The AEMP adaptive management framework identifies the triggers to determine effectiveness of mitigation and whether additional mitigation is required to address effects of the Project on water quality (Table 6.2-2, AEMP).

15.7 Vegetation Monitoring

Vegetation monitoring during Construction will be in accordance with the VMP and summarized in Table 15.7-1.

Table 15.7-1: Vegetation Monitoring Plan

Monitoring Activity	Measurable Parameter (s)	Frequency[1]	Timing
Office and field review of pre-clearing surveys and boundaries	• Pre-clearing survey is completed and sensitive features and mitigation specified • Boundaries and works zones flagged (RMAs) • Clearing is within *Mines Act* permit boundary • Clearing work windows are identified and work is during the correct window	Variable	Prior to clearing occurring
Vegetation clearing	• Clearing dimension size in relation to planned activity • Avoidance of rare plants, ecosystems at risk, riparian areas through implementation of pre-clearing survey, flagging, and mitigation measures	Variable	When clearing is occurring
	Clearing work windows: • for instream works refer to the *Fisheries Act* authorization (to be issued) • breeding bird season refer to the WMMP (Table 3.3-1)	Variable	When clearing is occurring
Post-clearing revegetation	• Total area disturbed (m^2) • Total area (m^2) revegetated and the specific prescriptions • Vegetation species cover, composition, diversity and, invasive plant species assessed at revegetation plots • Documentation of evidence of erosion including sheet erosion, rills, gullies • Annual inspections of the re-vegetated areas to assess performance objectives (including photos) compared to prescription targets • Evaluation of the success of the revegetation prescriptions in meeting site objectives and, if required, identification of additional mitigation activities	Annual	May to October
Post-clearing windthrow monitoring	• The effectiveness of windthrow reduction measures used; • The number and species of wind-thrown trees; • The approximate area affected; and • Bark beetle presence (e.g., Douglas-fir or spruce bark beetle)	Variable	March to September
Vegetation maintenance	• Vegetation maintenance within road and transmission line RoWs	Variable	March to September
	• Document management actions in RMAs to confirm consistent with RMA mitigation measures	Variable	When activity in RMA occurs

Monitoring Activity	Measurable Parameter (s)	Frequency[1]	Timing
Woody debris management	• Volume of wood cut (identified in License to Cut) • Volume of wood stockpiled or used for progressive reclamation • Volume of wood disposed of or sold • Assess fire hazard of stored woody debris • Bark beetles present that may cause forest health issues (e.g., Douglas-fir or spruce bark beetle)	Annual	April to October (fire hazard assessments); May to August (beetle assessments)

Note: A variable frequency indicates monitoring will be completed as required (e.g., prior to a clearing event or following completion of management actions) as determined by a qualified registered professional.

15.7.1 Invasive Plants

The invasive plant monitoring plan including monitoring frequency is provided in the in the IPMP, Section 9.

15.7.2 Effectiveness Monitoring

A TARP associated with vegetation monitoring is provided in Table 11-1 of the VMP.

15.8 Wetland Monitoring

A summary of the wetland monitoring program plan is provided below. A comprehensive monitoring plan, including endpoints and data analysis, is provided in the WMOP.

15.8.1 Pre-construction

There is a fair amount of uncertainty on the amount of wetland loss and offsetting as described in the WMOP. As such, and pursuant to DS Condition 5.5.1, BW Gold is conducting pre-construction surveys within the CPD boundary (except the TL alignment and three re-routes) to supplement baseline data from the Environmental Assessment, confirm absence of red- or blue-listed wetlands, map wetland extent, and classify wetlands. Planning for these surveys have been initiated and will be completed in 2022. The survey results will be provided to the IAAC, BC EAO, ECCC, FLNRORD and Indigenous groups. The survey results will be used to refine the current wetland balance amount of wetland loss requiring compensation, provide a baseline for offsetting monitoring and assist in planning additional offsetting. The WMOP will be updated in 2022 to incorporate additional information provided by the additional 2022 baseline programs and will address the full scope of project development construction activities.

The scope of pre-construction surveys in 2022 included:

1. The potential wetland near the plant site was delineated with flagging and GPS coordinates by a QP from ERM and Indigenous Monitors from LDN and UFN were invited to participate. The plant site tree clearing activity has also been flagged for the project IEM who was invited to observe tree clearing near the delineated potential wetland polygon (Appendix G from WMOP). Sediment and Erosion Control measures such as silt fencing and haybales were installed after the tree clearing to ensure any potential impacts to the delineated wetland from spring freshet are mitigated. This area was monitored closely during the spring melt period. A post-trip report was be prepared and provided to Aboriginal Groups and the BC EAO.

2. Detailed mapping of wetlands from aerial photographs on the mine site at a scale of 1:5,000.
3. Field surveys of the mine site to classify mapped wetlands into wetland associations based on the vegetation communities at each site and identify any red or blue-listed wetlands on the mine site.
4. Field surveys of the mine site to assess wetland function and provide baseline conditions for future monitoring program (discussed below).
5. Detailed mapping and field surveys of the Matthews Creek offsetting site to identify the current conditions on site and provide baseline data for a future monitoring program.
6. Detailed mapping and field surveys of the reference sites to provide a baseline to measure natural change in the future.
7. Reconnaissance field surveys of other wetlands in the regional area to assess them as potential additional offsetting areas.

15.8.2 Monitoring Loss of Wetlands in the Project Boundary during All Phases

The extent, location, and type (class and association) of wetlands impacted by the development of the Project will be recorded in a GIS database using pre-construction polygons a base layer overlain by as-built survey results and reviewed by a QP. This database will be updated annually to record all actual wetland losses. The baseline surveys and assessment conclusions were conservative and overestimate the area of impacted wetlands so an accurate accounting of each affected wetland will help confirm EA predictions and determine the overall requirements for offsetting.

15.8.3 Timing and Frequency

Monitoring activities will be completed annually during the Construction phase during July/August commencing and continuing at discrete construction sites through the life of mine.

15.9 Wildlife Monitoring

A summary of the wildlife monitoring program plan to be implemented prior to construction and during construction activities is provided below. The comprehensive monitoring plan, including endpoints and data analysis specific to each species, is provided in the WMMP.

15.9.1 Pre-construction

Amphibians

The DS Condition 8.10 requires that if construction cannot be planned to avoid the sensitive periods identified in Condition 8.9, then pre-construction surveys will be conducted to identify western toad breeding habitat.

Field surveys during the baseline program (2011 to 2013) identified breeding ponds for western toad inside the planned Project footprint. Sources of current breeding ponds will be identified using these baseline data and pre-construction surveys in the mine site and transmission line right-of-way. Surveys will follow standard methods for pond breeding amphibians described in *Inventory Methods for Pond-Breeding Amphibians and Painted Turtle (*RIC 1998).

Pre-construction surveys were conducted during the summer of 2021 following standard time-limited visual encounter survey protocols, searching ponds for adults, tadpoles, and metamorphs. These data are being presented in a 2021 baseline report which have been incorporated into the WMMP. Maps and breeding locations reported during baseline studies in 2013 will also be included in this report. Data will be used to inform plans for clearing during operations, taking into account sensitive periods.

Bats

Both DS and EAC Conditions require pre-construction surveys to be conducted to determine whether hibernacula and roosts occur and their distribution (P 23c, DS 8.14, 8.15).

Hibernacula surveys include:

- The mine site and transmission line right-of-way will be searched for rock outcrops and these areas searched for cave entrances. If cave entrances are found, then Autonomous Recording Units (ARUs) will be used to record whether bats are using these caves as hibernacula.
- During the fall, concurrent with other surveys, the buildings of the existing camp will be searched for signs of bats using buildings as hibernacula.

Roost surveys include:

- The mine site (and a buffer surrounding the mine site) and transmission line right-of-way will be searched for wildlife trees and snags (dead, standing mature trees) in suitable roosting habitat – near foraging habitat such as wetlands where insects are abundant. Wildlife trees will be marked and their position recorded.
- Wildlife trees will be searched for signs of bat roosts – lifted bark, droppings, and sounds.
- Methods for roost surveys will take into account FLNRO (2014) Section 2.4.1.
- Autonomous Recording Units will be placed in wetlands to determine if bats are present in these areas.

In accordance with EAC Condition 23.C Table 1, an inventory will be kept of features that may function as hibernacula and roosts. If it is not possible to conduct clearing outside of the sensitive season for bats, then pre-clearing surveys would be conducted at these features and mitigation applied including setback buffers.

Pre-construction surveys were conducted during the summer of 2021 for the hibernacula and roost surveys described above. These data are being presented in a 2021 baseline report which has incorporated into the WMMP. Maps and breeding locations reported during baseline studies in 2013 will be included in the WMMP.

Caribou

Please refer to the Caribou Mitigation and Monitoring Plan.

Moose

Condition 23d of the EAC directs BW Gold to conduct pre-construction surveys to confirm or update the habitat suitability mapping for moose:

> *“the means by which information from the habitat suitability mapping for the Project Site will be confirmed or updated for the use of the Project Site by grizzly bears and moose prior to Construction at the Project Site, and in consultation with Aboriginal Groups.”*

Pre-construction field surveys were undertaken in summer 2021 to conduct habitat suitability field validation for several key species, including moose, in the mine site and transmission line right-of-way.

Pre-construction surveys:

- Followed British Columbia Wildlife Habitat Ratings Standards;
- Were conducted by wildlife biologists with members of Aboriginal Groups;
- Considered existing terrestrial ecosystem mapping of the project site to identify habitat types for further assessment;
- Will be used to evaluate the existing habitat suitability mapping, with data and results reported in a 2021 baseline wildlife report; and
- A technical report and report for lay audiences will be delivered to Aboriginal Groups at least 60 days prior to the start of construction at the Project site.

Condition 23c of the EAC and federal condition 8.6 require BW Gold to conduct pre-construction surveys for habitat features for moose, including mineral licks. Federal condition 8.2 also requires that the locations where wildlife corridors cross Project roads be identified and wildlife crossing signs be installed prior to construction.

Provincial standards or guidelines do not exist for identifying mineral licks and trails. Field surveys for licks were conducted during summer of 2021 and included walking surveys in the mine site and transmission line right-of-way during other surveys (habitat suitability mapping, birds, and amphibians) with incidental reporting of salt licks whenever they were observed. Surveys for wildlife corridors included driving and walking surveys along project roads to identify trails and wildlife sign. These data will be reported in a 2021 baseline wildlife report and have been incorporated into the WMMP, along with any comparable data collected as part of baseline studies 2011-2013 and 2016-2017.

Furbearers

Pre-construction baseline surveys were undertaken in 2021 to conduct field verification of habitat suitability mapping and identify suitable habitat for key species, including denning habitat for furbearers (American marten, fisher, wolverine) in compliance with DS Condition 8.10.

Field surveys for furbearer denning habitat suitability (American marten, fisher, and wolverine) were conducted from June 8 – June 19, 2021 in the mine site and transmission line local study areas. Field survey protocols followed the *Wildlife Habitat Rating Standards* (RIC 1999a).

Survey locations were assessed for abiotic and biotic ecosystem variables, and rated for each species denning habitat suitability using a six-class system from nil to very high. Habitat ratings were further refined in the field based on the plot-in-context, distance to species specific habitat features, and distance to disturbance. Wildlife sign was also recorded at each site to document relative level of use of the site. These data will be reported in a 2021 baseline wildlife report and have been incorporated into the WMMP, along with any comparable data collected as part of baseline studies

Grizzly Bear

Condition 23d of the EAC requires pre-construction surveys for grizzly bear so that:

> *"…information from the habitat suitability mapping for the Project Site will be confirmed or updated for the use of the Project Site by grizzly bears and moose prior to Construction at the Project Site, and in consultation with Aboriginal Groups."*

Pre-construction field surveys were conducted in the mine site and transmission line right-of-way during the summer of 2021. Surveys and follow up were designed to meet EAC Condition 23d. These surveys:

- Considered existing terrestrial ecosystem mapping of the Project site to identify habitat types for further assessment;

- Followed standard habitat suitability mapping standards in British Columbia Wildlife Habitat Ratings Standards;
- Included Aboriginal Groups working with wildlife biologists to conduct the surveys in the field;
- Will be followed by a 2021 baseline report which evaluates the accuracy of the habitat suitability mapping for the Project;
- Will be followed by an assessment of mitigation measures for grizzly bear, and new mitigations consistent with the BC Environmental Mitigation Policy will be added if required; and
- Will be followed by a technical report and report for lay audiences delivered to Aboriginal Groups at least 60 days prior to the start of Construction at the Project site.

Birds

DS Condition 4.3 requires pre-construction surveys in the mine site and transmission line right-of-way to validate the results of habitat suitability modelling for migratory birds, including migratory birds that are listed species at risk. Survey results will be used to inform mitigation measures for migratory bird habitat and will be incorporated into the WMMP in consultation with Aboriginal and Indigenous groups and relevant provincial and federal authorities.

DS Condition 8.16 requires pre-construction surveys for short-eared owl in high-value nesting and foraging habitat.

Pre-construction surveys will include:

- Habitat suitability model validation for migratory birds, including migratory birds that are listed species at risk, conducted by the Proponent and presented in the Application/EIS and Blackwater Gold Project – Waterbird Memo;
- Validation of the applicability of fisher habitat suitability model for interior forest habitats to migratory birds, as identified by in Blackwater Gold Project – Forest Birds;
- Surveys for migratory bird species at risk and their habitat within the LSA to identify any additional mitigation measures required during construction; and
- Identifying areas of the transmission line route which pose a higher mortality risk to birds, for implementation of mitigation measures and follow-up monitoring.

Pre-construction field surveys will be undertaken within the mine site and transmission line right-of-way following provincial protocols for habitat suitability mapping.

- Field surveys for birds are required to ground-truth habitat suitability mapping models. Surveys follow RISC standards and during the breeding bird season one year prior to construction:
  - RIC 1998. Inventory Methods for Forest and Grassland Songbirds, Version 2.0;
  - RIC 1999. Inventory Methods for Waterfowl and Allied Species, Version 2.0;
  - RIC 1998. Inventory Methods for Swallows and Swifts, Version 2.0;
  - Knight et al. (2019) Canadian Nightjar Survey Protocol, 2019, which replaces RIC (1998) Inventory Methods for Nighthawks and Poorwills, Version 2.0; and
  - RISC 2006. Inventory Methods for Owl Surveys, Version 1.0.

Pre-construction surveys were conducted during the summer of 2021 to accomplish these goals. Species-specific surveys were conducted for several species at risk that require specialized surveys due to their unique natural history. The data from these surveys will be reported in a 2021 baseline wildlife

report. Based on the results of pre-construction surveys conducted in 2021, mitigation measures will be updated, as necessary, in consultation with Aboriginal and Indigenous groups and relevant authorities.

15.9.2 Pre-clearing

Furbearers

If construction is scheduled during sensitive time periods, pre-construction surveys will be conducted to identify American marten, fisher, and wolverine denning habitat (WMMP Table 4.5-1; DS 8.9, 8.10). Planning for surveys and adaptive management for probable active dens will be in consultation with FLNRORD and Aboriginal and Indigenous groups. Surveys will generally follow *Inventory Methods for Medium-Sized Territorial Carnivores – Coyote, Red Fox, Lynx, Bobcat, Fisher, and Badger, Version 2.0* (RIC 1999b). Ground-based surveys, stratified by habitat suitability, will be conducted in winter prior to any clearing or construction in the sensitive period. Detailed surveys methods are provided in Section 4.5.2.1 of the WMMP.

Grizzly Bear

DS Condition 8.10 and EAC Condition 23c indicate that if construction cannot be avoided during the sensitive periods for bears, that pre-construction surveys will be conducted for grizzly bear denning habitat. Detailed surveys methods are provided in Section 4.6.2.1 of the WMMP.

Birds

EAC Condition 23c, Table 1, indicates that if vegetation clearing must occur during the sensitive period, then pre-clearing surveys will be conducted to identify active nests and establish appropriate setback buffers. Detailed survey methods are provided in Section 4.7.2.1 of the WMMP.

Note that “pre-construction surveys” are conducted to gather information for planning purposes ahead of the construction period. In contrast, “pre-clearing surveys” are conducted in the closest window possible prior to vegetation clearing during sensitive periods (typically within one week), if clearing cannot be feasibly conducted at another time.

15.9.3 Mitigation Measure Effectiveness Monitoring

Wildlife monitoring will be conducted during construction to evaluate the effectiveness of mitigation measures and inform adaptive management. Not all mitigation measures can be directly monitored, but mitigation measures that can be monitored are provided in Table 15.9-1, and further detailed in the WMMP (Section 4).

Additional wildlife monitoring will be initiated during the construction period in support of federal follow-up programs in accordance with the WMMP. However, this work has long-term objectives (e.g., population-level monitoring) and the results will likely not provide meaningful opportunity for adaptive management at the time-scale of construction (i.e., 2 years).

Table 15.9-1: Mitigation Measure Effectiveness Monitoring for Wildlife

Potential Effect	Wildlife Valued Components	Mitigation	Monitoring Method	Frequency
Clearing and Construction				
Habitat Loss	Plant Species and Ecosystems at Risk	Clearing and construction mitigations to minimize disturbance (establish targeted no work zones and demarcated buffers)	Report on construction mitigations implemented during clearing	Annual during Construction
Habitat Alteration – Sediment Control	Amphibians, Birds, Plant Species and Ecosystems at Risk	Manage sediment and erosion risks during clearing and construction	Report on sediment control measures implemented	Annual during Construction
Habitat Alteration – Timing Windows	Amphibians, Bats, Birds, Caribou, Furbearers, Grizzly Bear	Conduct clearing and construction during least-harm timing windows wherever practicable, or conduct pre-clearing/pre-construction surveys and implement mitigations	Pre-construction surveys, report on Project clearing and construction activities	Annual
Habitat Alteration – Vegetation Management	Birds, Plant Species and Ecosystems at Risk	Minimize forest edge area, maintain edge habitat, and reduce windthrow risk	Report on forest edge management and windthrow risk assessment	Annual
	Plant Species and Ecosystems at Risk	Manage equipment and clearing to avoid introduction of invasive plant species	Invasive species monitoring program	Annual
Habitat Alteration – Wetlands and Riparian Habitat	Amphibians, Insects, Waterbirds	Construction mitigations: no work zones, vegetated buffers, sediment/erosion control, waste management	Wetlands monitoring program	Annual
	Amphibians, Birds, Plant Species and Ecosystems at Risk	Manage drainages to minimize loss or diversion of drainage systems	Report on drainage management measures	Annual during Construction
Disturbance	All	Incidental reporting of wildlife	Incidental reporting of wildlife, wildlife cameras	Annual
	All	Training personnel on wildlife policies and mitigation measures - conduct onboarding and refreshers	Report on number of personnel who have undergone onboarding and refresher trainings	Annual

Potential Effect	Wildlife Valued Components	Mitigation	Monitoring Method	Frequency
Disturbance *(cont'd)*	Caribou	Stop nearby work if caribou are observed on the Project site during construction	Incidental reporting of wildlife	Annual
	Caribou, Moose	Identify mineral licks outside of the Project footprint, buffer these areas if the are retained and apply mitigation	Pre-construction surveys, Report on mitigation actions	One-time
Roads				
Habitat Alteration	All	Use existing roads and reclaim roads wherever practicable	Length of new roads constructed and length of roads reclaimed following construction, compared to high quality habitat for each VC	One-time
	Caribou, Furbearers, Grizzly Bear, Moose	Manage vegetation to reduce attractiveness of roadsides	Report on vegetation management activities	Annual
Disturbance	All	Use of buses to reduce traffic	Monitor traffic on access roads	Annual
	All	Establish and enforce set speed limits	Monitor speed limits	Annual
	All	Avoid using salt on roads wherever possible	Report on use of anti-icing agents	Annual
	Caribou, Moose, Furbearers, Grizzly Bear	Manage snow banks to allow animals to cross	Audit of snow banks	Annual
	All	Restrict access to mine site by visitors	Report on records from security personnel	Annual
	Amphibians, Caribou, Moose, Furbearers, Grizzly Bear	Identify wildlife trails and potential road crossings, provide signage where trails meet roads	Pre-construction surveys, reporting of road incidents, report on signage	Annual

15.10 Archaeological and Cultural Heritage Monitoring

Archaeological sites and cultural heritage resources will be monitored to address adverse effects on known and as-yet unknown heritage resources or values described in the:

- Cultural and Spiritual Resources Management Plan.

Known and as-yet unknown sites (as identified by the chance find procedure) potentially affected by Project activities will be monitored as summarized below:

- Sites within 50 m of Project activities will be flagged as "No Work Zones" on the ground and monitored by the EM and Aboriginal Monitors during construction in the vicinity of the site.
- Sites that are identified by Indigenous groups as confidential will be monitored by the Aboriginal Monitors during construction in the vicinity of the site.
- Sites located 50 to 150 m of Project activities will be monitored on an annual basis by the EM and Aboriginal Monitors to verify that known heritage sites remain intact and are not impacted by the Project and check the condition of site protection (i.e., flagging or fencing).
- Monitoring records will be maintained and reporting will be conducted as described in Section 16. Indigenous group representatives and/or Indigenous Knowledge Holders will be invited to be involved, and/or, identify representatives who will be involved, in the implementation of the Cultural and Spiritual Resources Management Plan.

15.11 Noise and Vibration

Noise compliance monitoring will occur once during the Major Works Construction phase comprising a total of two seasonal measurements; the first being during the early spring/summer (March through June), and the second being during the late fall (September through November) in accordance with Section 10.2.2 of the NVEMP.

Monitoring will be conducted at two locations, summarized as follows:

- M1 – Construction Camp area; and
- M2 – Doug short ranch.

The locations are shown in Figure 10-1 of the NVEMP.

Compliance monitoring will require a minimum of 48 hours of continuous monitoring at each location, which may be extended depending on local influences (wind, rain, abnormal noise events etc.), as directed by the QP for environmental noise. Monitoring shall be conducted with a sound level meter that meets the minimum technical specifications in the IEC or EN 61672-2 (2013) + AMD1:2017 CSV Class 1 or newer, for Class 1 sound level meters.

16.0 Reporting and Record Keeping

Internal reporting is the responsibility of the Environmental Monitor. External reporting is the responsibility of BW Gold's EM, with delegation as necessary to appropriate personnel. Consultants and contractors hired to implement reporting aspects of the monitoring programs will be suitably qualified registered professionals or qualified persons.

16.1 Internal Reporting

16.1.1 Weekly Inspection

Environmental Monitors will document field observations and photos in a weekly Environmental Compliance Checklist.

16.1.2 Monthly Report

The Environmental Monitors will summarize key findings, outcomes, challenges, successes, work areas, incidents, and non-compliance issues in a monthly Consolidated BW Gold Construction Report. This report will provide environmental performance metrics, track issues, provide overview of progress, provide updates on permitting and environmental compliance and support communications related to the Project's progress.

Monthly updates of the implementation of the CEMP will be provided to the Environmental Monitoring Board (EMB) and Environmental Life-of-Mine Committee (ELoMC) through either verbal updates or short presentations.

16.1.3 Completion Reporting

A Project Completion Report (PCR) will be prepared by the Environmental Monitor for distribution to the contractors and BW Gold at the completion of the initial Construction phase, and after defined construction projects during Operation. The PCR will contain the following information and provide a high level overview of the extent of the Project construction and environmental successes and challenges:

- Project organization and parties;
- Description of the extent and type of construction across the Project and challenges;
- Communication approach and success;
- Overview of the environmental requirements for the Project;
- Examples of environmental mitigation measures (both successful and inadequate);
- Compliance summary for the nature and type of incidents and environmental impacts;
- Recommendations for improvements for environmental performance; and
- The Environmental Monitor's professional designation and qualifications.

16.1.4 Incident Reporting

Environmental incidents will be communicated by the individual who detects an incident to their superintendent and to the Environmental Manager.

Incident and non-compliance reports will be prepared by either the area or contractor supervisor and/or the Environmental Monitor for distribution to the Project Team and any applicable regulatory agencies. Key information to include in the incident report includes:

- The location, cause and nature of the incident;
- Environmental or Project features affected (e.g., road, watercourse, forest land, infrastructure);
- Time, extent, and magnitude/quantity of material or area affected;
- Response and actions to control the incident;
- Any follow-up tasks required, mitigation/remediation/corrective actions, or additional sampling needs;
- Notifications of the incident and communication within and outside the Project Team; and
- Typically photographs, GPS location, and a map are included for clarification and understanding of proximity risks.

Environmental incidents during Construction can be grouped into two general categories based upon impact magnitude and complexity.

Minor incidents have no permanent or long-term impact on the environment and are generally small scale in nature with simple remedies and may occur frequently on a construction project.

Major environmental incidents are infrequent, can have widespread, permanent or lethal/toxic impacts, are complex to resolve, and may require extensive remediation or cleanup resources.

Minor incidents with little consequence to the environment will be reported within 24 hours to the Environmental Monitor. Examples of minor incidents include non-compliance with mitigation measures, lack of spill cleanup equipment, and non-compliance with flagging of sensitive areas. Cleanup and remediation of the incident will be the responsibility of the Contractor, in consultation with the Environmental Monitor, to address the causes, potential impacts, and long-term risks. The Contractor's Environmental Representative, with the support of the Environmental Monitor, will complete an Environmental Incident Report Form within 48 hours detailing the root causes, consequence, impacts, remediation approach, recommendations and any photos or maps. The Contractor's Environmental Representative/Manager, Environmental Monitor, and Site Superintendent will review and sign-off on the incident report and provide copies to the Contractor and BW Gold's Environmental Manager within 48 hours. Minor issues are generally resolved immediately and no follow-up is required once addressed. Minor issues of similar nature that begin to occur frequently will trigger further investigation.

Major incidents are those with the potential to cause permanent, widespread, lethal, or cumulative impacts: a pollution release to the environment, a contravention of legislation and/or permit conditions, or risk to human health and safety. These incidents are rare, but are more complex and resource intensive to remediate than minor incidents. Examples of major incidents include a major sediment release into a stream and damage to fish habitat or critical wildlife habitat (e.g., bear den).

Major incidents must be reported immediately to the Environmental Monitor, EPCM Contractor, EM, and applicable regulatory agencies. The Contractor must immediately respond to control, contain, and minimize any impact on the environment or risk to people. An Initial Incident/Spill Report Form will be completed within the same day as the occurrence by the Contractor's Environmental Representative. The Initial Incident/Spill Report will detail the root causes, consequences, impacts, and remediation approach for the incident as well as any recommendations, photos, or maps.

The Contractor's Environmental Representative, the Environmental Monitor and the EPCM Contractor, and the EM will conduct an immediate investigation and site visit to prepare a Major Incident Report and provide copies to the Contractor and BW Gold within 24 hours. External agency and Indigenous group/ stakeholder notification may be required and will be conducted by BW Gold in accordance with the Accident

and Malfunction Administration and Communication Plan. Control of a major incident may require assistance from external agencies (e.g., sediment discharge into a sensitive area, etc.) in which case BW Gold will coordinate the response. Extensive follow-up, sampling of the environment, and remediation may be required during or after a major incident.

A draft Environment Incident Report form is provided in Appendix H for information purposes only. A current version of the form will be available onsite.

Additionally, any incidents (human-wildlife interactions where there is active deterrence and direct harm, injury, damage, or wildlife mortality occurs) will have formal incident reporting completed in accordance with Section 5.1.1 of the WMMP. A draft Wildlife Incident Report form for use during the Construction phase is provided in Appendix I for information purposes only. A current version of the form will be available onsite.

16.2 External Reporting

16.2.1 Compliance Reporting

Compliance reporting will be subject to *Mines Act* and *Environmental Management Act* permit conditions and Conditions 5, 12(l), and 36 of the EAC.

16.2.2 Environmental Life of Mine Committee

BW Gold has established the Environmental Life of Mine Committee (ELoMC)and its terms of reference pursuant to EAC Condition #19 Committee meetings will be the primary venue to provide regular construction updates and report monitoring results. Monthly meeting materials will be distributed to ELoMC members a minimum of 5 business days prior to the next scheduled meeting (when possible) and will be a standing agenda item for discussion. BW Gold will maintain and distribute meeting minutes for each committee meeting.

16.2.3 Environmental Assessment Certificate Reporting

Annual Reporting

Condition 5 of the EAC sets out reporting requirements. BW Gold must submit a report to the attention of the BC EAO and Aboriginal Groups on the status of compliance with EAC #M19-01 at the following times:

a. At least 30 days prior to the start of Construction;

b. On or before March 31 in each year after the start of Construction;

c. At least 30 days prior to the start of Operations;

d. On or before March 31 in each year after the start of Operations;

e. At least 30 days prior to the start of Closure;

f. On or before March 31 in each year after the start of Closure until the end of Closure;

g. At least 30 days prior to the start of Post-closure; and

h. On or before March 31 in each year after the start of Post-closure until the end of Post-closure.

BW Gold will submit reports to the BC EAO and Aboriginal Groups within the timelines specified in Condition 5.

Independent Environmental Monitor Reporting

Condition 12(l) sets out phase completion reporting requirements to be prepared and submitted by the Independent Environmental Monitor. BW Gold will include provisions for a Construction phase completion report in the Independent Environmental Monitor's terms of engagement. Information sharing and reporting by the Independent Environmental Monitor will not be provided to BW Gold in advance of providing such information or reports to the Environmental Assessment Office and Aboriginal Groups.

Accidents and Malfunctions Reporting

Condition 36 sets out requirements to develop an Accidents and Malfunction Administration and Communication Plan. Accidents and malfunctions (triggering external notification as defined in the plan) that occur during the Construction phase will be reported to Aboriginal Groups, Tatelkus Indian Reserve 28, other nearby residents, local communities or other users of the area in accordance with the Accidents and Malfunction Administration and Communication Plan.

16.2.4 Federal Decision Statement Annual Reporting

DS Conditions 2.11, 2.12 and 2.13 set out annual reporting requirements related to the implementation of conditions in the DS. Condition 2.14 sets out information sharing requirements related to the annual reports. Reporting will commence when BW Gold begins to implement the conditions set out in the DS. Requirements in DS Conditions 2.11 – 2.14 are presented below.

DS Condition 2.11 requires:

> *"The Proponent [BW Gold] shall, commencing in the reporting year during which the Proponent begins the implementation of the conditions set out in this Decision Statement, prepare an annual report that sets out:*
>
> *2.11.1 the activities undertaken by the Proponent in the reporting year to comply with each of the conditions set out in this Decision Statement;*
>
> *2.11.2 how the Proponent complied with condition 2.1;*
>
> *2.11.3 for conditions set out in this Decision Statement for which consultation is a requirement, how the Proponent considered any views and information that the Proponent received during or as a result of the consultation, including a rationale for how the views have, or have not, been integrated;*
>
> *2.11.4 the information referred to in conditions 2.5 and 2.6 for each follow-up program;*
>
> *2.11.5 the results of the follow-up program requirements identified in conditions 3.14, 3.15, 3.16, 4.5, 5.5, 6.11, 6.12, 6.13, 6.14, 8.18.6, 8.20.5, 8.21, and 8.22 if required;*
>
> *2.11.6 any update made to any follow-up program in the reporting year;*
>
> *2.11.7 any modified or additional mitigation measures implemented or proposed to be implemented by the Proponent, as determined under condition 2.9 and rationale for why mitigation measures were selected pursuant to condition 2.5.4; and*
>
> *2.11.8 any change(s) to the Designated Project in the reporting year."*

DS Condition 2.12 requires:

> *"The Proponent [BW Gold} will provide the draft annual report to Indigenous groups, no later than June 30 following the reporting year to which the annual report applies. BW Gold will consult Indigenous groups on the content and findings in the draft annual report."*

DS Condition 2.13 requires:

> *"The Proponent [BW Gold], in consideration of any comments received from Indigenous groups pursuant to condition 2.12 shall revise and submit to the Agency [Impact Assessment Agency of Canada] and Indigenous groups a final annual report, including an executive summary in both official languages, no later than September 30 following the reporting year to which the annual report applies."*

DS Condition 2.14 requires:

> *"The Proponent [BW Gold] shall publish on the Internet, or any medium which is publicly available, the annual reports and the executive summaries referred to in conditions 2.11 and 2.13, the offsetting plan(s) referred to in condition 3.11, the compensation plan referred to in condition 8.18 and, if required, condition 5.3, the whitebark pine management plan referred to in condition 8.20, the communication plans referred to in conditions 6.15 and 10.5, the reports related to accidents and malfunctions referred to in conditions 10.4.2 and 10.4.3, the schedules referred to in conditions 11.1 and 11.2, and any update(s) or revision(s) to the above documents, upon submission of these documents to the parties referenced in the respective conditions.*
> *The Proponent shall keep these documents publicly available for 25 years following the end of decommissioning of the Designated Project. The Proponent shall notify the Agency and Indigenous groups of the availability of these documents within 48 hours of their publication."*

DS Condition 2.15 requires:

> *"When the development of any plan is a requirement of a condition set out in this Decision Statement, the Proponent [BW Gold] shall submit the plan to the Agency and to Indigenous groups prior to construction, unless otherwise required through the condition."*

16.3 Record Keeping

BW Gold will assume the responsibility of record keeping associated with the CEMP. Data will be entered into suitable electronic databases. Quality control checks will be performed by the environment team upon receipt of results. Data will be entered in a format and program(s) that allows for comparison between years and be stored in a single file format for each type of survey or monitoring activity. Monitoring data will be stored for 25 years beyond decommissioning, and be made available for review upon request for regulatory inspections and for Indigenous auditing purposes.

17.0 Evaluation and Adaptive Management

BW Gold will conduct and document quarterly review of the CEMP to assess the effectiveness of mitigation measures.

The CEMP is a living document that will evolve over time in response to the results of the construction environmental monitoring program, changing conditions or development at the site, updates to scientific methods, and through consultation and discussions with relevant stakeholders, including Aboriginal and Indigenous groups. This process of improvement with changing conditions is referred to as Adaptive Management.

The CEMP adaptive management framework as outlined in Section 5 contains the following elements:

- **Plan**
  - The CEMP includes planned mitigation measures and monitoring programs to meet *Mines Act* and *Environmental Management Act* permits conditions, and DS and EAC Conditions and is engaging with Aboriginal and Indigenous groups and relevant federal and provincial authorities on these measures and programs.
- **Do**
  - Implementing the mitigation measures as described in the CEMP.
- **Monitor**
  - The CEMP includes monitoring programs to detect potential effects and test Application/ EIS predictions.
- **Adjust**
  - The CEMP defines qualitative and quantitative triggers to measure the level of change relative to baseline conditions in order to determine whether construction mitigation measures need to be altered or additional mitigation measures implemented.

18.0 Plan Revision

The CEMP is a “living” document and it will be reviewed annually at a minimum. Changes to the CEMP, including additions or updates to site specific ESC prescriptions, SOPs, mitigation measures or monitoring programs, will be driven largely by revisions to discipline-specific management plans. Revised versions of the CEMP will be dated, version controlled, signed and provided along with a change log to the Ministry of Mines and Low-Carbon Innovation (EMLI), the Environmental Assessment Office (EAO), Ministry of Forests, Water, Lands and Resource Stewardship (MoF/WLRS), the Ministry of Environment and Climate Change (ENV) and Indigenous Groups and posted to BW Gold’s Project website in accordance with EAC Condition 42(c).

19.0 Qualified Registered Professionals

The contents of this CEMP have been derived from a number of standalone management plans (see Section 2) prepared by respective qualified registered professionals, where required. This CEMP has been developed under the direct supervision of, the following qualified registered professional:

Original signed

Rolf Schmitt, M.Sc., P.Geo.
Technical Director

20.0 References

Definitions of the acronyms and abbreviations used in this reference list can be found in the Acronyms and Abbreviations section.

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Appendix A Concordance Table with Environmental Assessment Certificate #M19-01 (June 21, 2019)

Appendix A: Concordance Table with Environmental Assessment Certificate #M19-01 (June 21, 2019)

Condition	Condition	Location in Plan
Condition 2 (Plan Development)	Where a condition of this Certificate requires the Holder to develop a plan, program or other document, any such plan, program or other document must, at a minimum, include the following information: a. purpose and objectives of the plan, program or other document;	Section 2
	b. roles and responsibilities of the Holder and Employees;	Section 3,Table 3-1
	c. names and, if applicable, professional certifications and professional stamps/seals, of those responsible for the preparation of the plan, program, or other document;	Section 19
	d. schedule for implementing the plan, program or other document throughout the relevant Project phases;	Section 6
	e. means by which the effectiveness of the mitigation measures will be evaluated including the schedule for evaluating effectiveness;	Section 17
	f. schedules and methods for the submission of reporting to specific agencies, Aboriginal Groups and the public and the required form and content of those reports; and	Section 16.1 (Internal Reporting); Section 16.2 (External Reporting).
	g. process and timing for updating and revising the plan, program or other document, including any consultation with agencies and Aboriginal Groups that would occur in connection with such updates and revisions.	Section 18
Condition 3 (Adaptive Management)	Where a condition of this Certificate requires the Holder to develop a plan, program or other document that includes monitoring, including monitoring of mitigation measures or monitoring to determine the effectiveness of the mitigation measures, the Holder must include adaptive management in that plan. The objective of the adaptive management is to address the circumstances that will require the Holder to implement alternate or additional mitigation measures to address effects of the Project if the monitoring shows that those effects: a. are not mitigated to the extent contemplated in the Application; b. are not predicted in the Application; or c. have exceeded the triggers identified in paragraph g) of this condition. The adaptive management in the plan must include at least the following: a. the monitoring program that will be used including methods, location, frequency, timing and duration of the monitoring;	Section 17 (Evaluation and Adaptive Management)
Condition 3 (Adaptive Management; *cont'd*)	b. the baseline information that will be used, or collected where existing baseline information is insufficient, to support the monitoring program;	No baseline information is required to be collected to support monitoring.
	c. the scope, content and frequency of reporting of the monitoring results;	
	d. the identification of qualitative and quantitative triggers, which, when observed through monitoring required under paragraph d), will require the Holder to alter existing, or develop new, mitigation measures to avoid, reduce, and/or remediate effects;	The CEMP does not include any triggers and will defer to triggers identified in management plans that apply during the Construction phase.
	e. the methods that will be applied to detect when a numeric trigger, or type or level of change referred to in paragraph g), has occurred;	The CEMP does not include any triggers. The CEMP will defer to triggers identified in management plans that apply during the Construction phase.
	f. a description of the process for and timing to alter existing mitigation measures or develop new mitigation measures to reduce or avoid effects;	
	g. identification of the new and/or altered mitigation measures that will be applied when any of the changes identified in paragraphs a) to c) occur, or the process by which those will be established and updated over the relevant timeframe for the specific condition;	
	h. the monitoring program that will be used to determine if the altered or new mitigation measures and/or remediation activities are effectively mitigating or remediating the effects and or avoiding potential effects; and	

Condition	Condition	Location in Plan
Condition 3 (Adaptive Management; *cont'd*)	i. the scope, content and frequency of reporting on the implementation of altered or new mitigation measures. If there are any requirements or mitigation measures required in the plan, program or other document for which adaptive management, or elements of adaptive management listed in paragraphs d) to l) are assessed to be not appropriate or applicable, the plan must include identification of those requirements and measures, and the rationale for that assessment.	
Condition 4 (Consultation)	Where a condition of this Certificate requires the Holder consult a particular party or parties regarding the content of a plan, program or other document, the Holder must, to the satisfaction of the EAO: a. provide written notice to each such party that: i. includes a copy of the plan, program or other document; ii. invites the party to provide its views on the content of such plan, program or other document; and iii. indicates: 1. if a timeframe for providing such views to the Holder is specified in the relevant condition of this Certificate, that the party may provide such views to the Holder within such time frame; or 2. ii. if a timeframe for providing such views to the Holder is not specified in the relevant condition of this Certificate, specifies a reasonable period during which the party may submit such views to the Holder; b. undertake a full and impartial consideration of any views and other information provided by a party in accordance with the timelines specified in a notice given pursuant to paragraph (a); c. provide a written explanation to each such party that provided comments in accordance with a notice given pursuant to paragraph (a) as to: i. how the views and information provided by such party to the Holder have been considered and addressed in a revised version of the plan, program or other document; or ii. why such views and information have not been addressed in a revised version of the plan, program or other document; d. maintain a record of consultation with each such party regarding the plan, program or other document; and e. provide a copy of such consultation record to the EAO, the relevant party, or both, promptly upon the written request of the EAO or such party. The copy of such consultation record must be provided to the EAO, relevant party, or both, no later than 15 days after the Holder receives the request for a copy of the consultation record, unless otherwise authorized by the EAO.	This draft of the CEMP was provided to Aboriginal Groups for review and comment. BW Gold revised the plan in response to comments.
Condition 13 (Construction Environmental Management Plan)	The Holder must retain one or more Qualified registered professionals to develop a Construction Environmental Management Plan. The plan must be developed in consultation with EMPR, ENV, FLNRORD, and Aboriginal Groups. The plan must include, at a minimum, the means by which the following will be addressed:	
	a. access management;	Section 9.1
	b. invasive plants management;	Section 9.9
	c. waste management;	Section 9.1
	d. emergency response	Section 11
	e. human-wildlife conflict;	Section 9.11
	f. visual resource management;	Section 9.1
	g. erosion and sediment control;	Section 9.2
	h. spill prevention and response for hydrocarbon storage and leaks or other accidental emissions from machinery or equipment;	Section 10
	i. metal leaching (ML) and acid rock drainage (ARD) management;	Section 9.6
	j. geological and terrain hazards; and	Section 9.1
	k. vegetation management.	Section 9.9

Condition	Condition	Location in Plan
Condition 13 (Construction Environmental Management Plan; *cont'd*)	The Holder must provide the draft plan that was developed in consultation with EMPR, ENV, FLNRORD and Aboriginal Groups to the EAO, EMPR, ENV, FLNRORD, and Aboriginal Groups for review a minimum of 90 days prior to the planned commencement of Construction or as listed in the Document Submission Plan required by Condition 10 of this Certificate.	BW Gold to provide the draft plan to EAO, EMLI, ENV, FLNRORD and Aboriginal Groups for review a minimum of 90 days prior to planned commencement of construction.
	The plan and any amendments thereto, must be implemented to the satisfaction of a Qualified registered professional throughout Construction and to the satisfaction of the EAO.	Future requirement

Appendix B Concordance Table with Federal Decision Statement Conditions (April 15, 2019)

Appendix B: Concordance Table with Federal Decision Statement Conditions (April 15, 2019)

Condition	Requirement	Location in Plan
Condition 2.1 (General Conditions)	The Proponent shall ensure that its actions in meeting the conditions set out in this Decision Statement during all phases of the Designated Project are considered in a careful and precautionary manner, promote sustainable development, are informed by the best information and knowledge available at the time the Proponent takes action (including community and Indigenous traditional knowledge), are based on methods and models that are recognized by standard-setting bodies, are undertaken by qualified individuals, and have applied the best available economically and technically feasible technologies.	Section 4
Condition 2.2 (General Conditions)	The Proponent shall, when mitigation is a requirement of a condition set out in this Decision Statement, give preference to avoiding the adverse environmental effect of the Designated Project over minimizing the adverse environmental effect of the Designated Project. If unable to avoid the adverse environmental effect, the Proponent shall give preference to minimizing the adverse environmental effect of the Designated Project over compensating for the adverse environmental effect of the Designated Project. If unable to minimize the adverse environmental effect, the Proponent shall compensate for the adverse environmental effect of the Designated Project.	Section 9
Condition 2.3 (General Conditions)	The Proponent shall, where consultation is a requirement of a condition set out in this Decision Statement: • 2.3.1 provide a written notice of the opportunity for the party or parties being consulted to present their views and information on the subject of the consultation; • 2.3.2 provide all information available and relevant on the scope and the subject matter of the consultation and a period of time agreed upon with the party or parties being consulted, not less than 15 days, to prepare their views and information; • 2.3.3 undertake a full and impartial consideration of all views and information presented by the party or parties being consulted on the subject matter of the consultation; • 2.3.4 strive to reach consensus with Indigenous groups; and • 2.3.5 advise the party or parties being consulted on how the views and information received have been considered by the Proponent including a rationale for why the views have, or have not, been integrated. The Proponent shall advise the party or parties in a time period that does not exceed the period of time taken in 2.3.2.	Section 16.2.4

Condition	Requirement	Location in Plan
Condition 2.4 (Consultation)	The Proponent shall, where consultation with Indigenous groups is a requirement of a condition set out in this Decision Statement, determine and strive to reach consensus with each Indigenous group regarding the manner by which to satisfy the consultation requirements referred to in condition 2.3, including: • 2.4.1 the methods of notification; • 2.4.2 the type of information and the period of time to be provided when seeking input; • 2.4.3 the process to be used by the Proponent to undertake impartial consideration of all views and information presented on the subject of the consultation; and • 2.4.4. the period of time and the means by which to advise Indigenous groups of how their views and information were considered by the Proponent.	Section 16.2.4

Appendix C Standard Operating Procedure – Overburden Monitoring

Appendix C: Standard Operating Procedure – Overburden Monitoring

Objective

Overburden materials monitoring is conducted to validate pre-mine ML/ARD characterization data and associated geochemical source term model assumptions. In addition, the understanding of overburden geochemistry is crucial for reclamation planning. The objective of this Standard Operating Procedure (SOP) is to provide guidance for BW Gold Ltd. personnel for the collection and preparation of overburden samples for the Blackwater Gold Project (the Project). The sampling protocols described in this SOP are intended to ensure that overburden sample collection and preparation methodology support accurate and representative geochemical characterization of overburden material encountered during site excavation activities. This SOP follows general requirements outlined in the Metal Leaching and Acid Rock Drainage (ML/ARD) Management Plan.

Scope

This SOP describes activities related to the operational ML/ARD monitoring of mine rock through the mine life of the Project and covers the following tasks:

- Sampling selection and collection protocols.
- Sample shipping and handling details.
- Select laboratory analyses and procedures.
- Quality assurance and quality control (QA/QC) requirements.
- Communications with the analytical laboratories.
- Documentation of results.

Definitions

ABA	Acid-Base Accounting
ML/ARD	Metal Leaching and Acid Rock Drainage
NAG	Non-Acid Generating
PAG	Potentially Acid Generating
PPE	Personal Protective Equipment, including hardhat, steel toed boots and safety glasses
QA/QC	Quality Assurance and Quality Control

Preparation*

The work covered by the SOP will be performed by responsible mine personnel following BW Gold's Health and Safety policies and procedures including the use of personal protective equipment (PPE), following safe work practices/procedures, and completing assessment of hazards and controls. Mine personnel implementing this SOP must be aware of potential hazards that include but are not limited to the following:

- Hazards:
  - Slips, trips and falls.
  - Working near heavy mobile and stationary equipment.

The following training is required for personnel implementing the activities outlined in this SOP.

- **Training:**
  - Knowledge of overburden sampling protocols.
  - Trained and qualified to conduct overburden sampling including SOP review and sign off.
  - Trained and qualified to work around heavy mobile and stationary equipment and in areas where explosives are used.
  - Knowledge of overburden geology.

This SOP requires the following equipment and supplies:

- **Equipment:**
  - Standard PPE.
  - Hand auger or trowel/shovel.
  - Flagging tape and/or marking paint.
  - Notebook.
  - Sample bag(s).
  - Zip ties.
  - Camera.
  - GPS.

** Note that the components listed do not reflect the laboratory equipment and training requirements for the execution of the on-site geochemical analyses.*

Implementation

The ML/ARD Management Plan requires overburden sampling to be conducted prior to and during excavation at a minimum sample frequency of one (1) sample per 25,000 m^3 of material disturbed. Where excavation of overburden amounts to less than 50,000 m^3 within a distinct Project area to be disturbed, a minimum of two well-spaced samples are to be collected. All samples should be mapped and recorded within a database such that the samples the spatial distribution of low- and high-risk overburden materials can be tracked. Overburden monitoring will ensure that appropriate material is being stockpiled in designated laydown areas and can be used for reclamation activities.

Tasks

	Person Responsible
Preparation	
• Sample tags are generated before sampling for every sample to be collected in the field. The tag identifies each sample with a unique identifier. Sample identifiers will be generated using the prefix “OB-”, a two-digit identifier for the calendar year, and a four-digit numerical value starting with 0001 for the overburden sample.	Mine Geologist/ Environmental Technician
Sample Collection	
• Each overburden sample needs to be collected by a qualified technician and/or geologist. The sample taken should represent material that will be disturbed during construction and mining activities.	
• Overburden samples will be collected prior to and during excavation of material as follows:	
- Prior: Test pits or transect samples from overburden area surface, after removal of surficial organic soil.	
- During: Composite samples from the deeper portions of the overburden cut that that are not reachable prior to excavation (e.g., near overburden bedrock interface).	
• Pre-excavation: Collect monitoring samples from test pits or hand auger holes that are at least 0.5 m in depth unless bedrock is encountered at a shallower depth. Collect a minimum of four (4) sub-samples from an equivalent number of auger holes along a transect or along a test pit. The transect or test pit should have a minimum length of 10 m. Each sub-sample should comprise at least 1 kg of material.	
• Excavation: Collect monitoring samples from active construction areas where overburden is being disturbed and exposed. Samples from this portion of the monitoring program will target deeper horizons (i.e., > 0.5 m depth) including material directly overlying the bedrock-overburden interface.	
- Where safe access allows, collect a minimum of four (4) samples from an equivalent number of auger holes along a transect (minimum length of 10 m). Sample collection should focus on the deeper zones of the overburden cut. If the bedrock-overburden contact is <0.5 m below the cut surface, recover samples from the excavation surface using a hand trowel or similar device.	
- Where access into the overburden cut is unsafe, collect the sub-samples from overburden stockpiles next to the excavation site. In this case, instruct the excavator operator to carefully place overburden material from the targeted area (≥ 10 m radius) into small stockpiles near the edge of the cut while roughly maintaining the spatial integrity. Then, conduct the sampling from these stockpiles in the same manner as described above.	
• Composite all sub-samples at equal proportion to create a sample representative of the transect or test pit. Each composite sample should comprise a minimum of 3 kg of overburden material.	
• Place a sample tag into the composite sample bag. Record the sample tag number along with sample characteristics any observations associated with the sample taken. At a minimum, include the following information recorded with each sample:	
- General soil characteristics.	
- Observations regarding grain size (e.g., presence and abundance of pebbles).	

- Location within pit on map or as coordinates.
- Any observations (e.g., Fe-staining, geological features, etc.).

- Seal the sample bag with a zip tie and prepare for delivery to the on-site laboratory for the analysis of aqua regia digestible metals. It is the technician's responsibility to give clear delivery instructions if the sample is not delivered personally.

  Note: All overburden geochemical analyses are to be conducted on the <2 mm fraction and therefore, the on-site lab will be required to screen the submitted sample before analysis the remove larger particle sizes.

QA/QC Sample Collection

- Collect a minimum of one (1) field duplicate sample for every 10 regular samples and send to an accredited external laboratory.
- Collect the field duplicate sample in the same manner as the primary sample. Ideally, the duplicate is a split of the test sample; whereby a larger composite sample amounting to at least 6 kg is collected from which the duplicate overburden material is sub-sampled.
- Place the duplicate in a separate sample bag with a unique sample ID tag. The duplicate sample ID tag and location must be recorded in the notes.

Analytical Parameters

- Send regular monitoring samples to the on-site laboratory for the analysis of aqua regia digestible metals and total sulphur by LECO furnace.
- Submit QA/QC (duplicate) samples to an accredited laboratory for the full suite of ABA analyses and solid phase element determination by aqua regia digestion. The full list of parameters to be measured shall be included on the COC and includes the following parameters:
  - Total S (LECO) and sulphate S (by HCl digestion).
  - Total inorganic carbon.
  - Modified neutralization potential (NP).
  - Aqua regia digestible metals.
- Ship the completed COC form with the QA/QC samples to the external laboratory and an electronic version sent via e-mail to a Qualified Person (QP) for geochemistry and the accredited laboratory.

Data Analysis and Record Keeping

All background information collected during sample collection as outlined above shall be digitized in an appropriate database. Overburden monitoring data will be compiled, linked with the background information, and evaluated by the Chief Geologist and reviewed by the Environmental Manager or designate with the help of a QP for geochemistry as needed. The definition of the environmental class (e.g., PAG1, NAG4, etc.) to inform ML/ARD management strategies will be based on analytical surrogates derived for aqua regia digestible metals results as described in the ML/ARD Management Plan. External analytical results of the QA/QC (duplicate) samples will serve the confirmation of the on-site laboratory performance as well as the ongoing validation of the surrogate accuracy. These data are to be merged with the master ML/ARD monitoring database as they become available.

Revision Control Sheet

Date	Nature of Change	Page Inserted, Replaced, Revised, or Cancelled	Prepared By
July 30, 2021	Initial Version		Lorax Environmental Services Ltd.
September 3, 2021	Revised based on review by Artemis		Lorax Environmental Services Ltd.
September 10, 2021	Revised based on additional review by Artemis		Lorax Environmental Services Ltd.

Appendix D Chytridiomycosis Prevention Protocol

Appendix D: Chytridiomycosis Prevention Protocol

Clean equipment by removing foreign material (e.g., mud, vegetation) and sediment. This is best done at the work site or at pre-identified wash areas nearby.

1. Detach parts and accessories to access all surface areas, remove interior seats and mats. Work top to bottom and clean interior last.
2. Physically remove foreign material and sediment, e.g., using shovels and brooms.
3. If needed, power-wash exterior with water pressure ≥ 620 kPa.

Disinfect equipment between work sites using chemicals such as Bleach (6% NaClO) or Vircon (1% KPMS).

1. Check ecological information and ecotoxicity hazards on the Manufacturer's Safety Data Sheet.
2. Apply disinfectant > 50 m away from aquatic habitats.
3. Follow safety guidelines for PPE, concentrations, application method, and contact time.
4. Rinse with water.

Dry equipment for 24 hours if disinfected, or for five days if not disinfected.

Appendix E White Nose Syndrome Prevention Protocol

November 6, 2014

Western Canada White Nose Syndrome Transmission Prevention

Contents:

Preventing a giant leap of the P.d. fungus is the most important thing humans can do for western bats.

Background

White Nose Syndrome (WNS) is a devastating disease that is destroying bat populations in North America. The cause of this disease is a cold-loving fungus *called Pseudogymnoascus (formerly Geomyces) destructans (P.d.),* which is expanding its range across North America at an alarming rate. WNS is expected to spread to western North America in the coming years.

Bats are an integral component of the ecosystem; as the primary consumer of night-time insects, bats play an important role in pest control for crops and forests. Bats are long-lived mammals; some species live over 40 years. Bats also have slow reproductive rates; most species have one young per year. Bat populations are vulnerable to WNS because they are unable to quickly bounce back from mass mortality, as has been evidenced in eastern North America.

WNS infected bat in Eastern USA

This document outlines how you can prevent a giant leap of the P.d. fungus to western North America, and minimize the possibility of spreading the fungus within the west if it is already here, or if it arrives in the near future.

Hibernating bats are most at risk to WNS disease. Bats that migrate (e.g. hoary bat) can travel hundreds and even thousands of kilometers, while *hibernating* bats do not tend to travel long distances between summer and winter roosts. There is a significant difference in bat diversity on the east and west side of the Rocky Mountains, suggesting this may be a partial barrier to bat movement. If bat-to-bat transfer remains the mode of spread for this fungus, and humans take precautions to not spread the fungus, the west could remain WNS free for many years. ***Preventing a giant leap of the P.d. fungus is the most important thing humans can do for western bats.***

Bat ecologist counts bats

Delaying the arrival of WNS to western North America also allows researchers more time to study western bats. Very little is known about the winter ecology of many bat species. The west has a richer species diversity of bats than in the east, and it is not known how WNS will impact western specific species. Biologists require time to learn about where western bat species overwinter, what constitutes critical winter habitat, and what is normal winter ecology and behaviour. By determining these details, western bats will benefit; and mitigation techniques can be developed to help reduce the impact of WNS in the west. At a minimum, enough will be learned about winter ecology to facilitate population recovery post-WNS.

WNS Risk Assessment Tool

Use this tool to determine if you are at risk to transmit WNS, and the actions you should take.

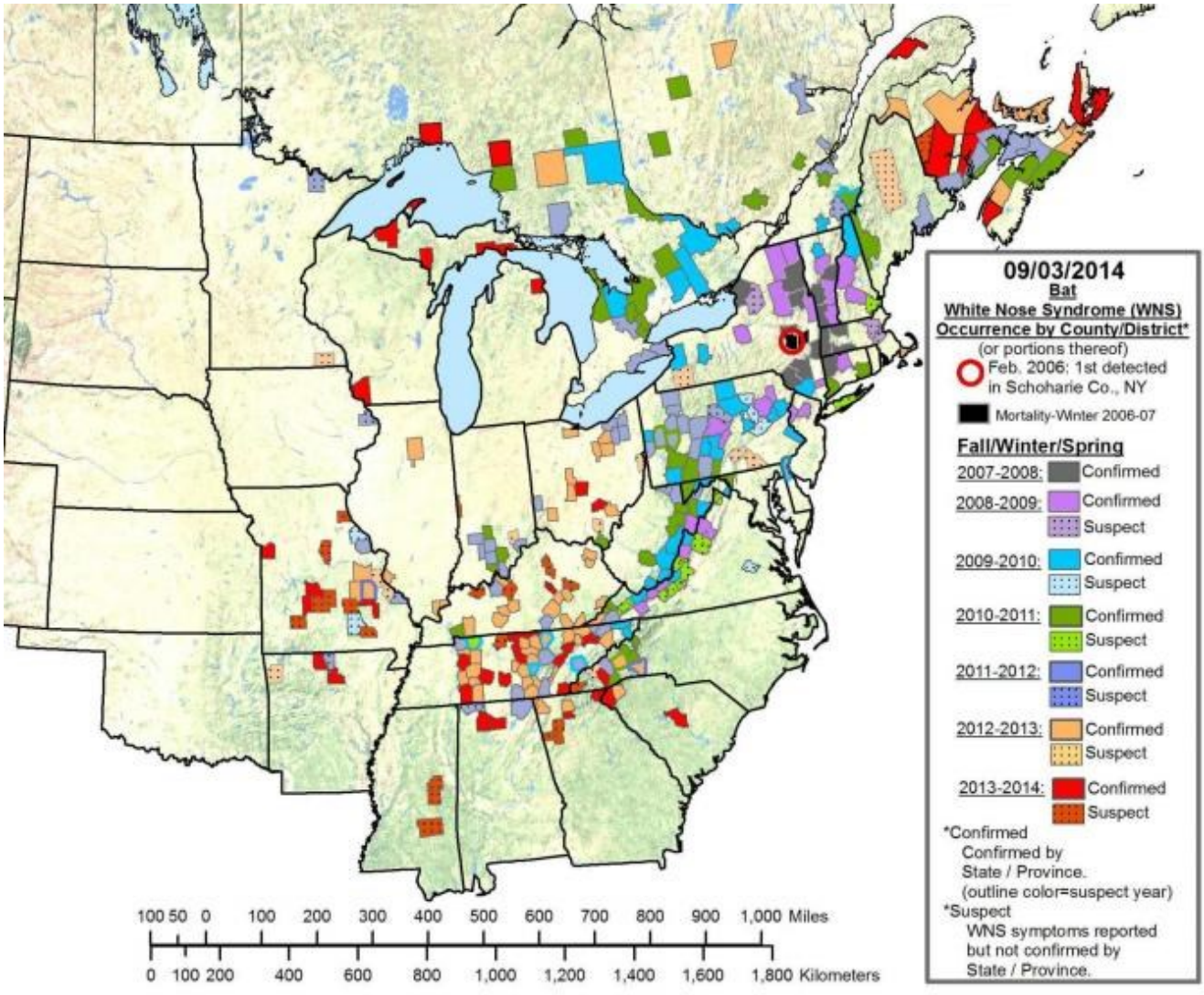
Scenario	Risk Level	Action	Description
You have been underground in western North America where *P.d. is not known to occur; bats or bat signs (e.g. guano, skeletons) were observed in the site.*	**Low**	**Report It** **Clean It**	Report your sightings, your information is critical to research. Thoroughly wash equipment, clothing & body. Ensure you are not bringing soil/ debris to another cave.
You have been underground in western North America where *P.d. is not known to occur; no bats and no bat signs were observed at the site.*	**Low**	**Clean It**	Thoroughly wash equipment, clothing & body. Ensure you are not bringing soil/ debris to another cave.
You have been underground outside of western North America. The area you visited is not known to have P.d. *This includes, but is not limited to: Manitoba, American mid-West, and Mexico*	**Moderate**	**Decontaminate It**	Thoroughly wash equipment, clothing, and body; dispose of materials where possible instead of re-using (eg. soiled gloves), and decontaminate everything that is to be reused underground.
You have been in a cave/mine that has more than 10 recently dead bats evident	**High**	**Report It** **Swap It**	Do not re-use your equipment/ clothing in an underground location in an area that is not known to have *Pd.* **Equipment used in High Risk areas should not go underground in western North America**
You have been in a cave/mine that has bats that show signs of WNS	**High**	**Report It** **Swap It**	
You have been underground in an area known to have Pd. *This includes, but is not limited to: eastern North America, Europe, and Asia*	**High**	**Swap It**	

Purpose

In caves housing WNS-infected bats, spore levels are high and thus the chance of having spores on equipment and clothing is high. The greatest density of spore contamination is likely to occur on anything that enters into a WNS positive cave. Fungal spores are very resistant and are easily spread; risk of infection is extremely high if decontamination is not adequate. **Cavers should not go underground in the West with equipment or clothing that has been used underground in the East because of the high likelihood that this equipment has P.d. spores.**

Cavers want to ensure they are not the vector that spreads this disease. While decontamination techniques have been developed, their effectiveness in all situations on all substrates, is not proven. Decontamination techniques *reduce* the risk of spread of spores, but cannot guarantee it. Cavers must evaluate the level of risk they could transport of spores; the WNS Risk Assessment Tool (page 2) is intended to assist in cavers' choice of equipment and actions.

Because cavers respect their environment and value conservation, compliance with these protocols is expected.



Map by: Lindsey Heffernan, PA Game Commission

Report It

If you see or hear evidence of bats please report your findings. Winter sightings are particularly important to understanding the over-wintering behaviours of western bat species.

Report your bat sightings to:
Wildlife Conservation Society Canada: clausen@wcs.org
BC Bat Action Team: bcbats@gmail.com
Alberta Speleological Society: info@caving.ab.ca

Report any significant number of dead bats and/or signs of WNS (e.g., white muzzle) in western Canada to:
In Alberta: Margo Pybus, Provincial Wildlife Disease Specialist
Email: margo.pybus@gov.ab.ca Phone: 1-877-944-0313 or 780-427-3462
In British Columbia:
Dr. Helen Schwantje, Ministry of Forest, Lands and Natural Resources
Email: Helen.schwantje@gov.bc.ca Phone: 250-953-4285
Dr Purnima Govindarajulu, Ministry of Environment:
Email: Purnima.Govindarajulu@gov.bc.ca Phone: 250 387 9755

Healthy little brown bats

Clean It

Equipment used in caves with a **low risk** of having WNS should be cleaned to reduce the introduction of foreign matter to other caves. Dirt and debris should be cleaned with water. The use of scrubbing tools and pressurized water aid in a more thorough cleaning. Rope should be cleaned with a rope brush to better clean off grit. Pressure washers at car washes are not recommended because of the potential contact of petrochemical products with nylon caving equipment.

Decontaminate It

Equipment used in caves with a **moderate risk** of containing WNS should be decontaminated to eliminate spores that could be on caving equipment.

Reducing spore load can be done in two ways: 1. Removing spores, 2. Inactivating spores (can no longer cause infection). Spores can be removed from surfaces by thorough washing, however, because not all spores can be removed this way, especially from porous substrates such as rope, webbing, and clothing. Potential spores need to be killed/ inactivated. There are two options of decontamination to inactivates spores: A) Submersion in hot water and B) Chemical disinfectant

A) Submersion in Hot Water

The most universally available and preferred option for decontamination of gear is:
Step 1) Clean It following the instructions above. A gentle dish detergent such as Dawn or Camp Soap is encouraged and proven to be more effective in decontamination, but is not required.
Step 2) Submerse gear in water ≥50ºC (122ºF) for 20 minutes. Because fungal spores are resistant, it is crucial the ***50 for 20*** guideline be met. Cooler water or shorter time will compromise the effectiveness of this method. Soaking can be done in a standard washing machine, but may require adjustments to the hot water heater or additional hot water. Testing the effective temperature is required to determine viability.

B) Chemical Disinfectant

Alcohol based disinfectants, such as wipes and hand wash, are not effective for destroying P.d. spores

This option is intended for equipment that cannot be submersed in hot water.
Step 1) Clean dirt and debris off gear using water. The use of scrubbing tools, pressurized water and dish detergent such as Dawn or Camp Soap is encouraged and proven to be more effective in decontamination, but is not required.
Step 2) Disinfect in accordance with label of the chosen product
Disinfectant products must be used in accordance with the label and material safety data sheets (MSDS). Disinfectant products and the contaminated rinse water must be managed and disposed of as per product directions to avoid contamination of groundwater, drinking water, surface water, or any other form of water.
Two chemical treatments are available options include:
1. Household chlorine bleach solution (e.g. Javex) diluted to 10% by volume (1 part bottled bleach solution, 9 parts water).
2. Quaternary ammonium products containing 0.3% ammonium quaternary compounds (quatts). These quaternary ammonium products must be used at the label dilution for best fungicidal activity.
Products currently available in Canada:

- Clorox Disinfecting Wipes (.29 quatts*)
- Lysol Disinfecting wipes (.26 quatts*)
- ASEPTOL 2000 S.E.C. Repro Inc. http://www.secrepro.com/en/sanitary/aseptol_2000.php

Alcohol based disinfectants, such as wipes and hand wash, ***are not*** effective for destroying *P.d.* spores as determined by US FWS.
Note: Some products listed by the U.S. Fish and Wildlife Service (US FWS) decontamination protocol are not available in Canada.
* 0.26 quatt wipes were proven effective in testing by US FWS

Planning for Decontamination:

If you are going to a **moderate risk** cave you will have to decontaminate your gear before and after the trip:

- Choose gear that can be most effectively decontaminated. Rubber boots will be less affected by multiple hot water submersions or chemical treatments than leather boots; and because rubber is not porous, spores will wash away more easily.
- Prepare a strategy for cleaning and treatment of equipment. How and where will all equipment and waste materials be contained, stored, treated or discarded after your trip?
  - Bring bags - Gear should be isolated (quarantined) at the cave/mine entrance, in sealed plastic bags or containers. Be mindful of cross-contamination during quarantine, put your cave suit, boots and equipment into a garbage bag as soon as possible once you exit the cave or return to your vehicle.
  - Be aware of cross contamination. If equipment is not quarantined it can pass spores to camp gear, backpacks, and vehicles. Be prepared to clean and disinfect the outside surfaces of containers and bags prior to putting them in vehicles or storage areas. Do not wear your caving boots in your vehicle.
  - Mud on personal clothing, hair, and skin can also contaminate. On a best effort basis, wash and dry your person and clothing
- Removing mud and sediment before decontamination makes the process more effective (Shelley et al. 2013); efforts should be made to limit muck once you've emerged from the cave, and before equipment is sealed for transport.

….Continued on page 6

Continued from page 5

Gear – Ropes and tackle can be dedicated to a cave, so they do not require frequent decontamination. If this method is chosen, be conscientious of cross contamination during storage. Most ropes and nylon products have not been tested for impact of chemicals; Sterling brand ropes may be soaked in a quaternary ammonium solution for 15 min and rinsed with water. The ***50 for 20*** method is generally preferable due to lack of knowledge of the impact of chemicals on equipment.

Refer to provincial/federal regulatory or land management agencies to determine additional requirements for site visits.

The process of decontamination is about reducing the risk of transferring spores. Anything that is muddy or porous, such as helmet straps, needs to be decontaminated because they could be carrying spores.

Swap It

Under no circumstances should equipment or clothing used in a WNS affected area be used in Western Canada because there is a **high risk** of spore build-up on equipment/clothing in WNS positive caves. The implications of transferring spores are too great and the decontamination is not guaranteed effective.

Cavers who cave outside of western North America can choose from the following options 1) borrow gear while in a WNS area, 2) use old gear and not bring it back or 3) have a set of gear dedicated to use outside of western North America which must be isolated from other gear while in storage to avoid cross contamination.
By swapping gear, cavers greatly reduce the risk of being the vector that causes the giant leap of the P.d. fungus to western North America. When WNS arrives to western Canada the restrictions to cavers will increase and protocols will become more onerous.

It is in the cavers best interest to be diligent in handling and choosing equipment and they must be cognisant of the threat of WNS.

Stay Informed

This is a living document; it will be revised as new research and developments come available. It is recommended you refer to documents online to ensure you are reviewing the most up to date version.

Below are some links for further information on White Nose Syndrome:

White Nose Syndrome.org https://www.**whitenosesyndrome**.org/

White Nose Syndrome Map of North America and each province: http://www.ccwhc.ca/wns_maps.php

BC Bat Conservation fact sheet: http://www.env.gov.bc.ca/wld/documents/wldhealth/WNS_fact_sheet_BC_General_Public_Jan_2014.pdf

Decontamination procedures from US Fish and Wildlife https://www.whitenosesyndrome.org/.../national_wns_revise_final_6.25

Appendix F Fish Salvage Plan

470 Granville Street, Suite 630, Vancouver, BC V6C 1V5
Tel: 604-629-9075 | www.pecg.ca

Blackwater Project

Fish Salvage and Relocation Plan

Palmer Project #
2006501

Prepared For
BW Gold Ltd.

February 24, 2022

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1. Introduction

This Fish Salvage and Relocation Plan has been developed for the Blackwater Mine Project (the Project) in compliance with Condition 3.2.1 of the Project's Decision Statement, issued under Section 54 of the *Canadian Environmental Assessment Act*, 2012 (CEAA 2012) and in support of the application for a *Fisheries Act* Authorization, submitted to Fisheries and Oceans Canada (DFO). This document also is in support of the Fish Habitat Compensation Plan, submitted to Environment and Climate Change Canada (ECCC) as part of an application for amendment to Schedule 2 of the Metal and Diamond Mining Effluent Regulations.

The *Fisheries Act* prohibits the carrying out of any work, undertaking or activity, other than fishing, that results in the death of fish (Subsection 34.4(1)), and/or harmful alteration, disruption, or destruction (HADD) of fish habitat (Subsection 35(1)). Under Paragraph 35(2)(b) of the *Fisheries Act*, the Minister of Fisheries and Oceans may issue an authorization with terms and conditions in relation to a proposed work, undertaking or activity that may result in HADD or death of fish. This fish salvage plan is proposed to avoid death of fish by salvaging and relocating fish to areas outside the Project footprint.

2. Objectives

The overall objective of this Fish Salvage and Relocation Plan is to avoid killing fish during the Construction phase of the Project. To meet this objective, the salvage and relocation methodology described in this Fish Salvage and Relocation Plan will:

- Employ best practices and methods for fish capture, handling, and relocation that minimize stress on fish and support survival of fish (i.e., minimize lethal or sub-lethal effects on fish).
- Ensure accurate, thorough data collection throughout the fish salvage program.
- Avoid ancillary effects to fish residing in watercourses into which salvaged fish will be released.

3. Background

The Project is a planned open-pit gold and silver mine located 160 km southwest of Prince George and 110 km southwest of Vanderhoof in British Columbia (BC). The Project received the Environmental Assessment Certificate #M19-01 (Certificate) on June 21, 2019, under the *Environmental Assessment Act* (2002) and a Decision Statement on April 15, 2019, under the *Canadian Environmental Assessment Act* (CEAA 2012).

The majority of mine infrastructure (e.g., open pit, tailing storage facilities, waste rock areas, laydown areas, and buildings) falls within the headwaters of the Davidson Creek and Creek 661 watersheds. There will be direct loss of fish habitat under the mine site infrastructure, as well as indirect loss of habitat upstream of the mine site, as this habitat will be isolated and no longer able to support fish.

Affected watercourses requiring fish salvage include those within the Project footprint, potentially isolated upstream, or where downstream flow changes are permanent, including:

- Davidson Creek upstream of the Fresh Water Reservoir (Reaches 6 to 12)
- Davidson Creek headwater tributaries (Creeks 668328, 636713, and 704454 and various unnamed tributaries)
- Creek 661 tributaries (Creek 505659 and various unnamed tributaries)

The distribution of permanently altered or destroyed fish habitat that will be salvaged is shown in Figure 1. Downstream of the mine site, Davidson Creek will be altered due to flow changes, but will continue to support fish habitat and will, therefore, not be salvaged.

The only fish species present in the waters where fish salvage will occur is Rainbow Trout (*Oncorhynchus mykiss*). Outside of the annual spring/early summer period when adults migrate into Davidson Creek to spawn, only juvenile Rainbow Trout will be present in affected stream locations. Baseline studies indicate fish densities in affected streams are low. Mean fish densities (number of fish/100 m^2) in headwater streams in the Davidson Creek and Creek 661 watersheds in summers of 2011 and 2012 ranged from 0.09 (first order streams) to 1.90 (second order streams), and Rainbow Trout in those streams are typically juveniles between the ages of 0 and 3 years (AMEC 2013; AMEC 2014). Additional surveys were conducted in 2021 to corroborate these findings, but the data has not yet been published.

The stream reaches, areas, mean fish densities, and estimated number of fish in the affected streams, with confidence intervals, are shown in Table 1 with source data shown in Table 2. Table 1 has been derived from fisheries baseline data (AMEC 2013) collected at sites within the affected streams, in July and August 2011 and August to October 2012 (Figure 2). These data also informed selection of fish release locations presented in Section 1.7.

The number of fish within a sub-watershed (e.g., Creek 668328) or stream section (e.g., middle Davidson Creek; Reaches 6 to 10) was estimated by applying the mean density of fish across sampling sites in that area, to the total area of habitat in that sub-watershed or stream section. Reaches were aggregated, to allow for calculation of variance and confidence limits. Fish sampling results from electrofishing were used to make the estimates for fish numbers, as other sampling methods (minnow trapping) did not yield density estimates. An estimated 3,839 ± 2,429 fish reside in the affected areas (Table 1; Figure 1), over a linear distance of approximately 18.7 km and wetted area of 14.1 ha. This number of fish translates to a mean fish density of 2.72 fish/100 m^2 in the affected areas. The sections in lower and middle Davidson Creek

where fish will be relocated have average fish densities ranging from 0.43 fish/100 m^2 (Table 1) to 3.7 fish/100 m^2 (AMEC 2013).

In Davidson Creek, Rainbow Trout come from two closely related populations;

- A migratory population that resides in Tatelkuz Lake/Chedakuz Creek, and migrates into Davidson Creek as far upstream as the cascade barrier in Reach 11 to spawn and rear;
- A resident population in Lake 16 that spawns upstream of an impediment to fish passage (cascade barrier) in Reach 11 of Davidson Creek and/or in a small unmapped inlet stream located on the south side of Lake 16.

Rainbow Trout from Lake 16 (the headwater lake of Davidson Creek) are separated from the downstream adfluvial (i.e., migrating between lakes and streams) population, owing to a partial barrier (i.e., cascade) at the bottom of Reach 11 of Davidson Creek. The barrier impedes upstream passage of fish from the migratory (Tatelkuz Lake) population, however fish from the resident (Lake 16) population can migrate downstream over the cascade and mix with the migratory population.

370000 375000 380000 385000 390000

5905000 5900000 5895000

Chedakuz Creek
TATELKUZ LAKE 28 I.R.
Turtle Creek
Transmission Line
Fawnie Dome 1726m
Kluskus-Ootsa FSR
Airstrip
Mine Access Road
Creek 226858
Fresh Water Supply Pipeline
Tatelkuz Lake
Tatelkuz Lake Intake
Davidson Creek
Creek 314089
Creek 700
Top Lake
Snake Lake
Creek 636713
Main Dam D Crest
Creek 428073
Fresh Water Reservoir (FWR)
Environmental Control Dam (ECD)
Creek 668326
Main Dam C Crest
Creek 661
Creek 146920
Creek 543586
Creek 661
Chedakuz Creek
Creek 505659
Creek 704454
Site C West Dam
Lake 01428UEUT
Creek 705
Lake 16 Outlet Dam
Lake 15/16 Connector Channel
Lake 16
Lake 15
Ore Stockpiles
Open Pit
Mount Davidson 1856 m
Kuyakuz Lake

Legend

- Fish Salvage Watercourse
- Non Fish-Bearing Watercourse within the Fish Salvage Area
- Fish-Bearing or Potentially Fish-Bearing Watercourse
- Non Fish-Bearing Watercourse
- Watercourse Not Considered (Outside LSA)
- Reach Break
- Spot Height
- Elevation Contour (25 m interval)
- Exploration Road
- Forest Service Road
- Indian Reserve
- Mine Footprint[1]
- Local Study Area Boundary

[1]*Mine site components displayed with faded colours - see Figure 2-3 for more detailed descriptions.*

Scale 1:75000
UTM Zone 10N
NAD 1983 Datum

0 1 2
kilometres

N

Prepared For:

CLIENT: Artemis Gold Inc.
PROJECT: Blackwater
DRAWN: B. Elder
CHECKED: G. Wagner
PROJECT: 2006501
DATE: Oct 22, 2021

Prepared by:

Palmer

Distribution of Fish Salvage Areas in the Davidson Creek and Creek 661 Watersheds

FIGURE 1

Document Path: G:\Shared drives\Projects 2020\20065 - Artemis Gold Inc\2006501 - Blackwater Project 2020-2021\Mapping\Figures\5_ArcGIS\Fish Salvage Report\Figure 1 - Fish Salvage.mxd

Table 1. Watershed, Reach, Stream Order, Fish Density, Area, and Potential Number of Fish for Affected Stream Reaches.

Watershed	Creek/Reach	Area (m^2)	Mean Density (fish / 100 m^2)	N (number of density estimates)	Variance	SE	Margin of Error [2]	Lower CL for Density [3]	Upper CL for Density [3]	Estimated Number of Fish	Lower CL for Number of Fish	Upper CL for Number of Fish
Davidson Creek	Davidson Creek Reaches 6 to 10	44,345	6.32	8	19.60	1.57	3.07	3.25	9.39	2,803	1,443	4,164
Davidson Creek	Davidson Creek Reaches 11 and 12	3,714	14.48	4	246.64	7.85	15.39	0.92	29.87	538	34	1,109
Davidson Creek	Davidson Creek Unnamed Tributaries	11,435	Used mean density for Creek 668328 [1]							60	12	133
Davidson Creek	Creek 636713 Reaches 1 to 5, and tributaries	19,001	Used mean density for Creek 668328 [1]							100	21	221
Davidson Creek	Creek 668328 Reaches 1 to 4, and tributaries	18,524	0.53	5	0.53	0.32	0.64	0.11	1.16	97	20	215
Davidson Creek	Creek 704454 Reaches 1 to 7, and tributaries	36,843	0.43	8	0.19	0.15	0.30	0.13	0.73	159	49	269
Creek 661	Creek 505659 Reaches 5 to 7, and named and unnamed tributaries	7,223	1.13	5	1.43	0.53	1.05	0.08	2.17	81	6	157
Totals:		141,085								3,838	1,410	6,267

Notes on Table 1:

SE = Standard Error; CL = Confidence Limit

[1] Density estimates for Davidson Creek Tributaries and Creek 636713 were zero fish / 100 m^2, hence the mean density and confidence levels for Creek 668328 was used for these areas, as Creek 668328 is one of the larger tributaries (hence more conservative) of Davidson Creek and had the highest mean density of the two nearby Davidson Creek tributary creeks (668328 and 704454).

[2] The margin of error is 1.96 times the Standard Error (1.96 is the critical value for a 95% confidence interval).

[3] Confidence Limit calculated as: mean ± margin of error.

Table 2. Fish Sampling Results in Stream Reaches within the Areas to be Salvaged.

Watershed	Stream	Site ID	Reach	Gear Type	Date	Site Length (m)	Site Width (m)	Site Area (m^2)	Effort (s)	Species	Fish Catch	CPUE (fish/100 seconds)	Density (No./100 m^2)
Davidson Creek	Davidson Creek	FS-03	6	EF	17-08-11	100	4.75	475	1,637	RB	27	1.65	5.68
Davidson Creek	Davidson Creek	FS-03	6	EF	10-08-12	100	4.75	475	1,853	RB	24	1.30	5.05
Davidson Creek	Davidson Creek	FS-04	7	EF	17-08-11	100	4.74	474	2,007	RB	23	1.15	4.85
Davidson Creek	Davidson Creek	FS-05	7.1	EF	19-08-11	100	4.86	486	1,888	RB	41	2.17	8.44
Davidson Creek	Davidson Creek	FS-06	8	EF	11-08-11	100	2.02	202	1,746	RB	19	1.09	9.41
Davidson Creek	Davidson Creek	FS-07	9	EF	18-08-11	100	5.01	501	1,617	RB	3	0.19	0.60
Davidson Creek	Davidson Creek	FS-07	9	EF	9-08-12	100	4.00	400	2,142	RB	8	0.37	2.00
Davidson Creek	Davidson Creek	FS-08	10	EF	20-08-11	100	2.27	227	1,875	RB	33	1.76	14.54
Davidson Creek	Davidson Creek	FS-09	11	EF	13-08-11	100	1.42	142	1,481	RB	54	3.65	38.03
Davidson Creek	Davidson Creek	FS-09	11	EF	8-08-12	100	1.50	150	1,378	RB	10	0.73	6.67
Davidson Creek	Davidson Creek	FS-10	12	EF	13-08-11	100	2.62	262	1,264	RB	18	1.42	6.87
Davidson Creek	Davidson Creek	FS-10	12	EF	8-08-12	100	3.00	300	1,107	RB	19	1.72	6.33
Davidson Creek	Creek 636713	FS-72	3	EF	1-08-12	100	3.00	300	845	NFC	0	0.00	0.00
Davidson Creek	Creek 636713	FS-73	4	EF	1-08-12	100	0.50	50	523	NFC	0	0.00	0.00
Davidson Creek	Creek 688328	FS-94	1	EF	1-08-12	100	2.50	250	669	RB	3	0.45	1.20
Davidson Creek	Creek 688328	FS-49	2	EF	7-08-12	100	2.10	210	624	RB	3	0.48	1.43
Davidson Creek	Creek 688328	FS-49	2	EF	15-09-12	100	2.00	200	401	NFC	0	0.00	0.00
Davidson Creek	Creek 688328	FS-48	3	EF	8-08-12	100	1.10	110	785	NFC	0	0.00	0.00
Davidson Creek	Creek 688328	FS-50	4	EF	8-08-12	100	0.90	90	486	NFC	0	0.00	0.00
Davidson Creek	Creek 704454	FS-74	1	EF	9-08-12	100	3.50	350	1,370	RB	4	0.29	1.14
Davidson Creek	Creek 704454	FS-75	2	EF	7-08-12	100	3.20	320	929	NFC	0	0.00	0.00
Davidson Creek	Creek 704454	FS-76	3	EF	7-08-12	100	3.20	320	1,014	NFC	0	0.00	0.00
Davidson Creek	Creek 704454	FS-77	4	EF	5-08-12	100	2.60	260	852	RB	1	0.12	0.38
Davidson Creek	Creek 704454	FS-27	5	EF	20-08-11	100	2.24	224	1,060	NFC	0	0.00	0.00
Davidson Creek	Creek 704454	FS-27	5	EF	22-08-11	100	2.24	224	888	RB	2	0.23	0.89
Davidson Creek	Creek 704454	FS-78	5	EF	5-08-12	100	2.20	220	956	RB	1	0.10	0.45
Davidson Creek	Creek 704454	FS-62	6	EF	5-08-12	100	1.70	170	1,000	RB	1	0.10	0.59
Creek 661	Creek 505659	FS-86	1	EF	3-08-12	100	2.20	220	1,243	RB	6	0.48	2.73
Creek 661	Creek 505659	FS-87	2	EF	3-08-12	100	2.00	200	755	RB	2	0.26	1.00
Creek 661	Creek 505659	FS-88	3	EF	3-08-12	100	2.10	210	672	RB	4	0.60	1.90
Creek 661	Creek 505659	FS-89	4	EF	3-08-12	100	10.00	1,000	1,104	NFC	0	0.00	0.00
Creek 661	Creek 505659	FS-90	7	EF	2-08-12	100	0.70	70	464	NFC	0	0.00	0.00

Notes on Table 2:
CPUE = Catch-Per-Unit-Effort; NFC = no fish captured, EF = backpack electrofishing
Source: Table 5.10-10 of Appendix 5.1.2.6A (Fisheries Baseline) of the Application/EIS (AMEC 2014).

370000 375000 380000 385000 390000

5905000 5900000 5895000

Fawnie Dome 1726m

Kluskus-Ootsa FSR

Airstrip

Transmission Line

Mine Access Road

Chedakuz Creek

TATELKUZ LAKE 28 I.R.

HN-01

FS-67

FS-66

Turtle Creek

FS-01

FS-02

Tatelkuz Lake

Fresh Water Supply Pipeline

Tatelkuz Lake Intake

Creek 226858

Creek 314089

Davidson Creek

Creek 700

Top Lake

FS-70

Snake Lake

Creek 636713

Creek 428073

FS-03

FS-04

FS-05

FS-06

FS-07

HN-02

FS-73

FS-72

FS-94

FS-95

Creek 668328

FS-49

FS-48

FS-47

FS-46

FS-50

FS-81

FS-74

FS-75

FS-76

FS-08

Creek 505659

Creek 704454

FS-09

Lake 01428UEUT

Creek 705

FS-27

FS-77

FS-78

FS-10

FS-25

Lake 16

FS-63

FS-62

FS-90

FS-38

Lake 15

FS-99

FS-98

Mount Davidson 1856 m

FS-84

FS-91

FS-16

HN-03

FS-13

HN-04

FS-12

Creek 661

FS-83

FS-82

FS-89

FS-88

FS-87

FS-86

FS-14

FS-92

Creek 148920

Creek 543585

Creek 661

FS-15

Chedakuz Creek

Kuyakuz Lake

Legend

- Reach Break
- Spot Height
- Proposed Transmission Line
- Fresh Water Supply Pipeline
- Mine Access Road
- Elevation Contour (25 m interval)
- Exploration Road
- Forest Service Road
- Indian Reserve
- Mine Footprint
- Local Study Area Boundary
- Davidson Creek Watershed
- Creek 661 Watershed

Fish Sampling Sites

- Electrofishing
- Hoop Net
- Minnow Trap
- Gill Net
- Beach Seine

Scale 1:75000
UTM Zone 10N
NAD 1983 Datum

0 1 2
kilometres

N

Prepared For:

ARTEMIS GOLD INC

CLIENT: Artemis Gold Inc.
PROJECT: Blackwater
DRAWN: B. Elder
CHECKED: G. Wagner
PROJECT: 2006501
DATE: Oct 08, 2021

Prepared by:

Palmer™

Fish Sampling Sites in the Davidson Creek and Creek 661 Watersheds, 2011-2012

FIGURE 2

Document Path: G:\Shared drives\Projects 2020\20065 - Artemis Gold Inc\2006501 - Blackwater Project 2020-2021\Mapping\Figures\5_ArcGIS\Fish Salvage Report\Figure 2 - Fish Sampling Sites 2011-12.mxd

4. Roles and Responsibilities

A lead Registered Professional Biologist with experience in fish salvage and relocation will oversee implementation of the Fish Salvage and Relocation Plan. They will be responsible for ensuring planned field methods follow best practices, data and reporting undergo quality assurance and quality control (QA/QC), and communication is maintained with regulators and Indigenous groups.

Field crews reporting to the lead biologist will oversee fish capture and removal, data collection, and health and safety for field crew members. Field crews will conduct the fish salvages and data collection under the direction of a field crew lead. Field crew leads will be experienced in fish sampling methods (e.g., electrofishing, hoop nets, seine netting), fish handling and processing, and all crew members will have the necessary certification and training (e.g., electrofishing operator certification from a WorkSafe BC approved course).

An appropriate provincial Scientific Fish Collection Permit will be obtained prior to commencement of the fish salvage activities (approximately 4 weeks). All work will follow the conditions of the permit.

5. Timing

Construction of the Blackwater Project is scheduled over two years (Year -2 to Year 0). Fish salvage efforts will be staged according to the construction schedule and will take place during the open water season. Rainbow Trout spawning and incubation in the Project area occurs from mid-May to mid-August. Therefore, fish barriers (e.g., permanent fish fences, barrier nets) will be erected immediately downstream of all planned construction activities in Reach 6 of Davidson Creek, Creek 661 tributaries (Creek 505659 - Reach 5; Creek 146920 - Reach 3; Creek 543585 - Reach 2), and the outlet of Lake 16. These barriers will be erected after spring freshet ends and water levels are low enough to construct temporary and permanent fences. This timing will prevent adult Rainbow Trout from migrating upstream from Lake Tatelkuz or downstream from Lake 16 to spawn in areas where fish are to be removed and relocated.

The preferred timing for fish salvages in the mainstems of Davidson Creek and Creek 661 will be in mid-July to September when stream temperatures are above 5°C, due to temperature-related restrictions for electrofishing (FLNR 2021) and beneficial summer low flow conditions. However, fish salvages in the smaller tributaries of these streams may begin earlier in the open water season (e.g., July) due to site conditions likely allowing for complete salvage activities. Timing also will be dependent on construction stage timing, and the ability for field crews to gain access (i.e., ATVs for transporting fish) to some of the stream locations currently without access points or with difficult terrain. New roads and associated trails will be cut to access the upper reaches for Davidson Creek, Creek 661, and their tributaries.

Following fish salvages, a field and data summary report will be prepared, and data will undergo QA/QC and be secured. Data analysis and reporting, consistent with any permit requirements, will be conducted following the completion of salvage programs.

While the majority of the required fish salvage and relocation plan will take place during the Construction phase, all effects to Creek 505659 catchment in the Creek 661 Watershed will not occur until the end of the operations phase (i.e., spillway construction). However, for the purposes of this plan, it is assumed all water bodies requiring fish salvage will be salvaged during the Construction phase of the Project with the majority of the salvage occurring in Year -2. Potential for requiring fish salvage over multiple years depending on the construction plan.

6. Field Methods

There are no specific provincial or federal guidelines for carrying out fish salvage programs in streams lost due to mining activities. Existing federal guidance is for lakes and impoundments (DFO 2008; DFO 2011). As such, this plan is based on the existing guidance for lakes, where applicable, as well as general guidance and best practices for capturing, handling, and releasing fish. There are some wetland/pond locations in the Project area that may require fish salvage as well. Each individual fish salvage event in streams and wetland/ponds will be divided into three phases: isolation, collection/removal, and relocation.

The purpose of the fish collection and removal phase will be to expend reasonable effort to remove fish from streams and wetlands/ponds to be dewatered, by removing fish until catch-per-unit-effort reaches near-zero, as determined by the lead biologist. The approach to the fish salvage for each section of stream will be determined by the lead biologist and generally conform to the following steps:

- Gain access to the stream sections to be salvaged.
- Isolate the salvage area
    - Area to be fished will be isolated and fished in sections depending on the construction schedule.
    - Large areas will be subdivided into smaller reaches and fish fences/stop nets will be installed and maintained to continue fish isolation.
    - Use of discrete sections will allow for a monitoring of catch per unit effort (CPUE) and success of fish salvage.
- Capture fish using methods appropriate for the habitat and site based on efficiency and fish health.
    - Techniques may include a combination of multiple electrofishing passes, and hoop nets or seine netting of deeper pools.
    - Three pass methods for electrofishing and seining will be used in each stream section prior to moving on to the next section.
- Collect data on sampling effort, fish species, and biological data as outlined below.
- Relocate fish to appropriate release sites.

Captured fish will be enumerated and identified to species and life history stage. Length and weight measurements will be taken from a subsample. All captured fish will be temporarily held in clean containers holding water from the watercourse where the fish were captured. *In situ* water quality data (e.g., temperature, pH, dissolved oxygen, conductivity) will be collected during salvages. Captured fish will be visually monitored for signs of stress, and where necessary, measures will be applied to ensure fish health such as aeration, changing the water, expedited release at release location, and provision of cover within holding containers.

Captured/collected fish will be transferred and released at designated locations in lower Davidson Creek, lower Creek 661, and Lake 16 based on available access (Section 1.7). The duration for which fish are held in containment will be minimized and adjusted, as required based on fish health. Precautions will be taken to ensure fish are minimally affected by the transfer process (e.g., driving slowly and ensuring road surface is in good condition so as to avoid shaking/vibration of fish tanks, cooling water with ice during hot weather, and aerating fish tanks to ensure adequate dissolved oxygen). Fish will be released in suitable locations based on habitat suitability, fish density and other considerations as discussed below (Section 1.7).

Given the length of stream distance to be salvaged, the level of effort required to achieve near-zero catch-per-unit-effort will be extensive. It is likely to require up to four field teams of four members each, approximately 1 to 2 months to salvage the entire upper reaches of Davidson Creek, Creek 661, and their tributaries. Dewatering will occur once each section to be affected has been approved having fish salvage completed. During the dewatering process, deep pools will be inspected and, where necessary, any remaining fish collected and transferred.

7. Determination of Suitable Fish Release Locations

Suitable fish release locations have been identified in consideration of known Rainbow Trout population genetics, fish movements, habitat, and life history. Sites were selected to avoid ancillary effects, such as genetic material or parasite transfer by releasing fish into waters which they would use over their life history. Selected release locations are presented in Figure 3.

Rainbow Trout captured in the upper Davidson Creek and its tributaries, below the cascade barrier at the bottom of Reach 11, will be released downstream at multiple locations within lower Davidson Creek. The mine access road crossing location in Reach 6 of Davidson Creek marks the mine footprint boundary, and fish will be released downstream of this crossing, in Reach 5 or lower. As Rainbow Trout densities in lower Davidson Creek are low (3.7 fish/100 m^2; AMEC 2013) compared with provincial biostandards, competition for resources and likelihood of additional stress on relocated fish due to pressure from resident Rainbow Trout is expected to be low, as long as habitat availability is high. The estimated population of Rainbow Trout in lower Davidson Creek (Reaches 1-5) is approximately 1,757 fish. This estimate is produced based on CPUE electrofishing data, and the total area of these reaches, combined (AMEC 2013). Provincial biostandards suggest pre-restored Rainbow Trout habitat can maintain a density of 3.6 fish per 100 m^2 and restored habitat (i.e., fully functional) can maintain a density of 9.7 fish per 100 m^2 (Slaney and Zaldokas 1997). This upper range for functional Rainbow Trout habitat suggests further capacity exists in lower Davidson Creek for 2,867 of the potential additional 3,839 fish requiring relocation (see Section 3.0). It is important to use several release sites in Davidson Creek to avoid potential issues with local increased competition for food and increased predation by birds and mammals if relocation sites do not have enough available habitat. Salvaged Rainbow Trout numbers above the estimated upper capacity will be relocated to an alternative relocation site in Tatelkuz Lake (Figure 3).

Fish captured in Davidson Creek upstream of the cascade barrier in Reaches 11 and 12 will be released into Lake 16. Stop nets will be placed across the stream to prevent fish re-entry to salvaged areas that have not yet been dewatered. Lake 16 has limited surface water flow connectivity to Davidson Creek outside of freshet and is, therefore, a natural barrier to fish during seasonal low-flow periods. This potential natural barrier coupled with a stop net will provide isolation of the downstream work area. Once fish salvage is complete, a semi-permanent fish barrier will be erected immediately downstream of the Lake 16 outlet to prevent fish movement downstream until the lake is isolated during construction. The Lake 16 Rainbow Trout population is not expected to be affected by the addition of any fish captured and relocated from Sections 11 or 12 downstream of the lake. A fish survey performed in 2021 showed the previous estimate of 1,200 individuals in Lake 16 (AMEC 2013) to be potentially an order of magnitude too low. Therefore, the expected addition of approximately 538 ± 572 fish from the upper sections of Davidson Creek will not have adverse effects to the population in Lake 16.

Fish captured in the Creek 661 Watershed will be relocated to several locations downstream (Figure 3). Approximately 81 ± 76 fish are to be relocated within Creek 661 from the Creek 505659 catchment. Rainbow Trout density in Reaches 3, 4 and 5 range from 0.2 to 2.9 fish/100m^2 which is below provincial biostandards (3.6 fish per 100 m^2). Therefore, there is capacity to accept these fish without measurable adverse effects to Rainbow Trout present in the system. Multiple locations with available access points have been selected to reduce competition with fish already located in these stream sections.

370000 375000 380000 385000 390000

5905000 5900000 5895000

Fawnie Dome 1726m

Kluskus-Ootsa FSR

Top Lake

Creek 700

Creek 668328

Creek 636713

Creek 428073

Davidson Creek

Creek 314089

Creek 226858

Snake Lake

Chedakuz Creek

TATELKUZ LAKE 28 I.R.

Turtle Creek

Tatelkuz Lake

Creek 661

Creek 146920

Creek 543585

Creek 505659

Creek 704454

Lake 01428UEUT

Creek 705

Lake 16

Lake 15

Mount Davidson 1856 m

Kuyakuz Lake

Legend

- Potential Fish Relocation Site
- Alternative Fish Relocation Site
- Reach Break
- Spot Height
- Watercourse
- Forest Service Road
- Forest Service Road (unconfirmed)
- Proposed Transmission Line
- Fresh Water Supply Pipeline
- Mine Access Road
- Elevation Contour (25 m interval)
- Exploration Road
- Indian Reserve
- Mine Footprint
- Local Study Area Boundary
- Davidson Creek Watershed
- Creek 661 Watershed

Scale 1:75000
UTM Zone 10N
NAD 1983 Datum

0 1 2
kilometres

N

Prepared For:

ARTEMIS GOLD INC

CLIENT: Artemis Gold Inc.
PROJECT: Blackwater
DRAWN: B. Elder
CHECKED: G. Wagner
PROJECT: 2006501
DATE: Oct 07, 2021

Prepared by:

Palmer™

Potential Fish Relocation Sites in Davidson Creek and Creek 661

FIGURE 3

Document Path: G:\Shared drives\Projects 2020\20065 - Artemis Gold Inc\2006501 - Blackwater Project 2020-2021\Mapping\Figures\5 ArcGIS\Fish Salvage Report\Figure 4 - Potential Fish Relocation.mxd

Table 3 shows the suggested release locations for captured fish, the timing for capture and release, as well as alternate release locations. Areas and potential number of fish are taken from Table 1. A summary of the rationales for suggested timing and release locations also is provided in Table 3.

Specific release locations in lower Davidson Creek will be determined based on access and physical conditions, including flow levels, velocity, turbidity, and available habitat. Ideally fish will be released in slow-moving areas such as pools and back eddies to allow them time to acclimatize. Water quality will be measured *in situ* at release locations, to ensure conditions are similar to the capture locations and holding tanks.

Table 3. Areas to be Salvaged, Potential Fish Numbers, Timing, Release Locations, and Rationale.

Creek/Reaches	Area (m^2)	Potential Number of Fish		Preferred Timing for fish salvage	Suggested Release Location	Alternate Release Location	Further Rationale / Considerations
Davidson Creek Reaches 6 to 10	44,345	2803.2 ± 1360.3		July-August (after fence installed to prevent migration and spawning, and lower flows)	Lower reaches of Davidson Creek (1 to 5)	Lower Davidson Creek Overwintering Ponds or Tatelkuz Lake	Proportionally high fish numbers expected in these reaches of Davidson Creek. Fish will be released downstream at multiple locations in lower Davidson Creek. Davidson Creek overwintering ponds to be used as secondary release locations if available at the time of the fish salvage.
Davidson Creek Reaches 11 and 12	3,714	537.6 ± 571.6		June-July (after fence installed to prevent migration and spawning)	Lake 16	Lake 15	Reach 11 of Davidson Creek has 9 m^2 of potential spawning habitat, there is no spawning habitat in Reach 12. The 9 m^2 currently represents one third of the spawning habitat available to the Lake 16 Rainbow Trout population. Fish salvaged from Reach 11 of Davidson Creek are assumed to have been spawned by adults residing in Lake 16 and will be moved to Lake 16.
Davidson Creek Tributaries	11,435	60.1 ± 72.7		Open water season – unlikely to be spawning in this area, hence larger sampling window.	Reach 5 or 4 of Davidson Creek, or Lake 16, depending on confluence with Davidson Creek.	Further downstream in Davidson Creek or Lake 15 depending on confluence with Davidson Creek.	Davidson Creek unnamed headwater tributaries are 1st and 2nd order streams and are expected to have few fish during late-summer low flows. Fish captured in dewatered areas of these streams will be released into Lake 16 for those tributaries that enter Davidson Creek upstream of the cascade barrier at the bottom of Reach 11. For tributaries that enter Davidson Creek below the barrier, fish will be released into Reaches 4 and 5 of Davidson Creek or further downstream.
Creek 636713 Reaches 1 to 5, and tributaries. (Drains into Reach 8 of Davidson Creek)	19,001	99.9 ± 120.7		Open water season – unlikely to be spawning in this area, hence larger sampling window.	Reach 5 or 4 of Davidson Creek.	Further downstream in Davidson Creek e.g., Reach 2 or Tatelkuz Lake	Creek 636713 is a relatively small stream containing low-gradient wetland sections with predominantly fine substrates. Riffle-pool sections are present, but there are limited amounts of gravels suitable for spawning. Habitat in this stream is suitable mostly for summer rearing of juvenile rainbow trout. No overwintering habitat is available due to shallow water depths.
Creek 668328 Reaches 1 to 4, and tributaries. (Drains into Reach 9 of Davidson Creek)	18,524	97.4 ± 117.7		Open water season – unlikely to be spawning in this area, hence larger sampling window.	Reach 5 or 4 of Davidson Creek.	Further downstream in Davidson Creek e.g., Reach 2 or Tatelkuz Lake	Habitat conditions in Reaches 1 and 2 of Creek 688328 provide good summer rearing opportunities for fry and juvenile rainbow trout. Suitable gravels and spawning habitat are also present. However, no spawning activity or fry have been observed or captured, and juvenile Rainbow Trout densities were low in Reaches 1 and 2 during summer baseline sampling. Overwintering habitat quality is limited by low winter flows and shallow pool depths. Reach 5 of Creek 636713 is non fish bearing.
Creek 704454 Reaches 1 to 7 (Drains into lower Reach 10 of DC)	36,843	158.9 ± 110.0		Open water season – unlikely to be spawning in this area, hence larger sampling window.	Reach 5 or 4 of Davidson Creek.	Further downstream in Davidson Creek e.g., Reach 2 or Tatelkuz Lake	Creek 704454 had the lowest summer stream temperatures recorded in the Davidson Creek Watershed. The creek drains from Mt Davidson into lower Reach 10 of Davidson Creek. Habitat quality for all salmonid life histories is rated either good or fair in Reaches 1 through 5 of Creek 704454. Overwintering and spawning habitat quality dropped due to minimal residual pool depths and poor spawning gravels in Reaches 5 and 6, and the stream was dry in Reach 7 at the time of assessment (early August 2012).
Creek 505659 Reaches 5 to 7, and tributaries. (Drains into Reach 5 of Creek 661)	7,223	81.3 ± 75.7		Open water season – spawning unlikely in this area, hence larger sampling window.	Reach 4 of Creek 661.	Reach 1 of Creek 661 or Tatelkuz Lake	No visible channel is present in Reach 4 of Creek 505659. Habitat quality in the upper reaches provides some suitable rearing and migrating habitat, but poor to no overwintering and spawning habitat. In Reaches 6 and 7, the dominant substrate type is fines and the mean residual pool depth is less than 0.10 m. Higher quality habitat in Reaches 1 to 4, including spawning and rearing habitat. Access to Creek 661 downstream.

8. Reporting

A reporting protocol will be established based on conditions of the *Fisheries Act* Authorization and scientific fish collection permit. Reporting will provide: 1) a summary of fish salvage activities; 2) the fish catch (including any fish mortalities); 3) fish salvage effort data; and 4) a table detailing location of release sites cross-reference to associated baseline habitat data (if available) and the maximum number of fish (by life stage) that can be released at each site. Additionally, details will be provided on how data collected in preparation for and during the salvage will be used to update the current state of knowledge of the local study area and inform ongoing effects monitoring programs.

Following each year of fish salvage, an annual report will be prepared which will include all biological and water quality data, CPUE population estimates, QA/QC information, and discussion relating to how the objectives of the program are being met.

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CEO

9. References

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Appendix G Archaeological and Cultural Heritage Chance Find Procedure

BW GOLD LTD
a subsidiary company of Artemis Gold Inc

Blackwater Gold Project: Archaeological and Cultural Heritage Chance Find Procedure

APPLICATION

This procedure applies to previously unidentified physical or cultural heritage features or structures, sites, or things of historical, archaeological, paleontological, or architectural significance and provides mitigation measure to avoid or reduce adverse effects.

PROCEDURE

All those responsible for the management, implementation, and operation of any aspect of this procedure will be adequately trained for their role.

Employees and contractors will receive information related to heritage resources previously identified on site as well as cross-cultural training on the history of local Indigenous nations and training on the Chance Find Procedure on their arrival on site through an environmental on-boarding training session and prior to the start of work as part of the Site Orientation. The purpose of this training is to provide site personnel with a basic level of awareness related to heritage, spiritual and archaeological resources and an understanding of their obligations regarding compliance with plan, regulatory requirements, commitments and best practices.

Site supervisors will be provided with a copy of the CSMP and will receive additional training with respect to the Chance Find Procedure.

BW Gold will regularly review and update the training and awareness related to the plan based on changes in training needs and regulatory requirements.

Prior to the commencement of Project work, all workers will:

1. Have received training on the use of this procedure;
2. Have been provided information on typical identifiers for archaeological and cultural use sites;
3. Have reviewed and be aware of the requirements of this procedure;
4. Have reviewed and understood information pertaining to Chance Find Procedures appropriate for the work activity being undertaken.

If in the course of your work you discover what you suspect may be a possible archaeological, historic, cultural, spiritual and/or paleontological site, the following procedures apply:

Upon Discovery

1. Immediately halt work at the location of the discovery, except work required to be undertaken to protect the integrity of the discovery.
2. Delineate an area of at least 50 metres around the discovery as a ‘no work’ zone.
3. Note the location (GPS coordinates) and take photographs.
4. Inform your supervisory, Environmental Manager (EM) or Mine Manager immediately.
5. Prepare an initial Chance Find Form (attached).

Post-Discovery

- Within 24 hours of the discovery, the EM contacts the Project archaeologist and informs Indigenous groups and the Impact Assessment Agency (Table 1 provides key contact information).
- The EM invites Indigenous groups to monitor any work related to the discovery.
- The Project archaeologist conducts an assessment at the location of the discovery subject to BC's Archaeological Impact Assessment Guidelines and protocols that are in place with Indigenous groups respecting the discovery, handling, recognition, recording, transferring and safekeeping of previously unidentified structures, sites or things of historical, archaeological, paleontological or architectural significance and the confidentiality of a discovery.
    - If the discovery is an archaeological site, the Project archaeologist contacts the BC Archaeology Branch. The Project archaeologist, in consultation with the Archaeology Branch, conducts an investigation, and provides updates to the Archaeology Branch and Indigenous groups on the progress of the investigation. The Project Archaeologist works with the EM and Indigenous groups to prepare Site Report, which includes instruction to recommence work in the area. The Site Report is submitted to the EM, Indigenous groups and the Archaeology Branch.
    - If the discovery is a historic site, the Project archaeologist contacts Indigenous groups and local communities to determine site significance.
    - If the discovery is a cultural or spiritual site, the Project archaeologist contacts Indigenous groups to determine site significance.
    - If the discovery is a paleontological site, the Project archaeologist contacts BC's Fossil Management Office.
- Subject to protocols with Indigenous groups, any material discovered on the Project site is stored in a secure location with limited access as follows:
    - If the material is archaeological, the artifact is held by the Project archaeologist until the *Heritage Conservation Act* (HCA) Section 12 permit has expired and the artifact(s) is submitted to the repository designated in the permit.
    - If the material is historical, the repository is determined in consultation with Indigenous nations and local communities.
    - If the material is cultural and/or spiritual, the repository is determined by Indigenous nations.
    - If the material is paleontological, the repository is determined by the Fossil Management Office.
- The handling and storage of material, apart from material outlined in the HCA Section 12 permit, is determined in consultation with Indigenous Nations.

Suspected Human Remains Discovery

If in the course of your work you discover what you suspect may be human remains, the following procedures apply:

- Immediately halt work in the area of the discovery.
- Do not disturb or move the possible human remains.
- Note the location (GPS coordinates) and take photographs.
- Report your discovery to your supervisor, EM or Mine Manager.
- If you are unable to contact a BW Gold representative, and the suspected human remains appear to be current, contact the Vanderhoof RCMP.

The following steps will generally be followed:

- The Coroners Service (Northern Region) in Prince George and Vanderhoof RCMP will be notified and the Coroners Service will determine whether the matter is of contemporary forensic concern.
- If the remains are not of forensic concern, the Archaeology Branch will attempt to facilitate disposition of the remains.
- If a cultural affiliation for the remains can be determined, the Archaeology Branch will contact an organization representing that cultural group. If the remains are of Indigenous ancestry, the Branch will contact the relevant Indigenous communities.
- If remains are buried and under no immediate threat of further disturbance, they will not be excavated or removed. If the remains are partially buried or uncovered, the Archaeology Branch will facilitate disposition.

Table 1: Key Contacts

Name	Email	Phone Number
Archaeology Branch	Archaeology@gov.bc.ca	1 (250) 953-3334
Blackwater Gold	office.blackwater@artemisgoldinc.com	1 (250) 567-3276
Fossil Management Office	Fossil.Management@gov.bc.ca	1 (250) 356-7506
Ulkatcho First Nation	chief@ulkatcho.ca	1 (250) 742-3260
Lhoosk'uz Dené Nation	admin@lhooskuz.com	1 (250) 992-3290
Nadleh Whut'en First Nation	TBC	1 (250) 690-7211
Stellat'en First Nation	TBC	1 (250) 699-8747
Saik'uz First Nation	TBC	1 (250) 567-9293
Nazko First Nation	TBC	1 (250) 992-7982
Skin Tyee Nation	TBC	1 (250) 694-3517
Tŝilhqot'in Nation	TBC	1 (778) 799-2145 or (250) 392-3918
Métis Nation British Columbia	Communications@mnbc.ca	1 (604) 557-5851
Nee-Tahi-Buhn Band	TBC	1 (250) 694-3494
Impact Assessment Agency	iaac.vancouver.aeic@canada.ca	1 (604) 666-2431
BC Coroners Service Northern Region (Prince George)	N/A	1 (888) 991-2111 (toll free) 1 (250) 861 7429
Vanderhoof RCMP	N/A	1 (250) 567-2222
Prince George RCMP	N/A	1 (250) 562-3300

Cultural Heritage Chance Find Report Form

Recorder's Name/Affiliation:_____

Date:_____

Location of chance find (Location description,
UTM coordinates, development, depth below surface):_____

_____

_____

_____

Description of find:_____

_____

_____

Method used to mark and protect find:_____

_____

_____

Distribution:

☐	☐	☐	☐	☐
BW Gold	Site Archaeologist	Indigenous Nations	Archaeology Branch	Fossil Management Office

Sketch Map	Photo

Appendix H Environmental Incident Report Form

Blackwater Gold Project **Environment Incident Report**

Date (YYYY-MM-DD)	
Time:	
Reported By	
Photo Taken (Y/N)	
Location (Name of location)	
UTM East:	
UTM North:	

Incident Description / Extent / Magnitude or Quantity of Material or Area Affected:
(Append maps if required, refer to photos etc)

Incident Response:

Incident Response Actions:

Action (Owner)	Date Completed

Follow-up Tasks:

Action (Owner)	Date Completed

Notification:
(List all individuals to be notified)

Photos and Description:
Photo #1 (Brief Description, Add labels)
Photo #2 (Brief Description)
Photo #3 (Brief Description)

Appendix I Wildlife Incident Report Form

Blackwater Gold Project **Wildlife Incident Report**

Date (YYYY-MM-DD)	
Reported By	
Photo Taken (Y/N)	
Location (Name of location)	
UTM East:	
UTM North:	

Species (BT=bat; CB=caribou; MT=marten; FS=fisher; WV=wolverine; WF=wolf; WT =western toad; GB=grizzly; MO=moose; OT=other)	
Number Observed	
Sex (M=male, F=female, MF=male and female, FF=female and female, U=unknown, UUU = 3 unknown, etc., X=No Data	
Age (A=adult; C=cub; AC=adult and cub; CC=cub and cub; U=unknown; etc. X=No Data	
Condition (H=healthy; P=poor condition; W=wounded; U=Unknown, X= No Data)	
Comments (i.e., unusual observation; health of animal)	

Type of Incident (INT=interaction with field crew; V=vehicle; A= aircraft; MIF=mine infrastructure; M=mortality, X=no Incident)	
Deterrent Used (Y/N)	
Type of Deterrent (H=Heli; V=vehicle; B=bangers; S=screamers; R=rubber bullet; BB=bean bag; N=other noise deterrent, X=no incident)	
# of deterrents used (X=No deterent used)	

Incident Description / Communications / Response

Photos and Description:
Photo #1 (Brief Description)
Photo #2 (Brief Description)
Photo #3 (Brief Description)

Appendix J Transmission Line Construction Environmental Management Plan

ARTEMIS GOLD INC

Blackwater Mine

Transmission Line Construction Environmental Management Plan

Table of Contents

List of Tables

Work Instructions

Transmission Line Construction Environmental Management Plan

Version	F.1
Replaces	E.1
Creation Date	09/04/2023
Scheduled Review Date	
Review Date	
Document Team Members	
Document Owner:	
Document Approver:	
Related Documents:	
Key Contacts:	
Change Requests:	

1.0 Project Overview

The Blackwater Gold Project (the Project) is a gold and silver open pit mine located in central British Columbia (BC), approximately 112 kilometres (km) southwest of Vanderhoof, 160 km southwest of Prince George, and 446 km northeast of Vancouver. The Project site is presently accessed via the Kluskus Forest Service Road (FSR), the Kluskus-Ootsa FSR and an exploration access road, which connects to the Kluskus-Ootsa FSR at km 142. Electrical power for the Project will be supplied by a new approximately 135 km and up to 140 m wide corridor, 230 kilovolt overland transmission line (TL) that will connect to the BC Hydro grid at the Glenannan substation located near the Endako mine, 65 km west of Vanderhoof. A brief description of the proposed TL is as follows:

- From the Glenannan substation to the mine site permit area, the TL will be permitted by way of Licence of Occupation (LOO);
- The TL will be constructed within a cleared right-of-way (RoW) of 40 metre (m) width for standard spans, but up to 50 m width for longer spans in select areas. The TL RoW area is approximately 541 ha for the entire length of 135 km;
- Existing permitted and non-status roads will be used for the purpose of accessing the RoW. New access trails and stream crossings will be located only within the TL cleared RoW;
- Equipment and material laydown areas will also lie within the cleared RoW; and
- The construction workforce will be housed at the Project camp or other independent commercial accommodations in the area.

Overall Project construction is anticipated to take two years. The TL is anticipated to take approximately 14 months to construct. Post-construction, most of the temporary access trails used for construction on the TL RoW will be deactivated and/or decommissioned within 3 years except for those required for maintenance. During operation of the TL there will be periodic inspections and maintenance as well as occasional unscheduled power supply interruptions that will require inspection and maintenance/repair activities.

Once commissioned, the TL will support mine development and operation. It is currently assumed that mine water will require treatment at the Membrane Water Treatment Plant in perpetuity. As operation of the plant will require electricity, it is likewise assumed the TL will operate in perpetuity and there are no plans to decommission the line at this time. The mine site is located within the traditional territories of Lhoosk'uz Dené Nation (LDN), Ulkatcho First Nation (UFN), Skin Tyee Nation and Tsilhqot'in Nation. The Kluskus and Kluskus-Ootsa Forest Service Roads (FSRs) and Project TL crosses the Traditional Territories of Nadleh Whut'en First Nation (NWFN), Saik'uz First Nation (SFN), and Stellat'en First Nation (StFN; collectively, the Carrier Sekani First Nations) as well as the Traditional Territories of the Nazko First Nation (NFN), Nee Tahi Buhn Band, Cheslatta Carrier Nation and Yekooche First Nation (EAO 2019a and 2019b).

Additional details on TL components and activities are presented in Section 3.2 of the Transmission Line Initial Project Description (TL IPD; BW Gold 2022).

2.0 Purpose and Objectives

The Transmission Line Construction Environmental Management Plan (TL CEMP) identifies measures to minimize and manage potential environmental risks during the transmission line construction (Project Year -2 and Year -1). The Engineering Procurement and Construction (EPC) Contractor may also have their own environmental management plans, which will be reviewed by BW Gold for alignment with, at a minimum, the requirements in the TL CEMP.

The objectives of the TL CEMP are to:

- Identify procedures and mitigation measures to manage construction-related environmental impacts; and
- Identify roles and responsibilities associated with environmental management.

The TL CEMP addresses the environmental management requirements that support the application for an interim LOO and Statutory RoW for the transmission line under the *Land Act*. The TL CEMP also provides information that is required in Environmental Assessment Certificate #M1901 (EAC) Condition 13, and references Section 9.4 of the Joint Application Information Requirements for *Mines Act* and *Environmental Management Act* Permits (JAIR; EMPR & ENV 2019). As the TL is a major project component of offsite infrastructure, this standalone TL CEMP has been developed to be integrated with the Issued for Construction (IFC) plans and the Construction Execution Plan (CEP), which are currently being developed by EPC Contractor.

2.1 Related Documents

The TL CEMP is a component of the Project's Environmental Management System (EMS) and is related to several other management plans and standard operating procedures (SOP), referenced throughout the document where mitigation measures have been incorporated. The TL Initial Project Description (IPD) is a complementary document also providing information on TL access and the Map Book (TL IPD – Appendix A). The related management plans are listed below:

- TL Surface Erosion Prevention and Sediment Control Plan (TL SEPSCP);
- TL Sedimentation Monitoring Plan – Framework and Guidelines (TL SMP-FG; EAC Condition 29);
- TL Fuel Management and Spill Control Plan (TL FMSCP);
- TL Wildfire Management Plan (TL WMP);
- TL Noise and Vibration Management Plan (TL NVMP);
- TL Industrial and Domestic Waste Management Plan (TL IDWMP);
- TL Agriculture and Range Management Plan (TL ARMP);
- TL Archaeological and Cultural Heritage Resources Management Plan (TL ACHRMP);
- TL Air Quality and Dust Management Plan (TL AQDMP);
- TL Integrated Vegetation Management Plan (TL IVMP):
  - Rare and Plant Species at Risk Management SOP,
  - Coarse Woody Debris Management SOP,
  - Riparian Area Management SOP,
  - Wetlands Management SOP,

  - Old Growth Forest Management SOP,
  - Invasive Plant Management SOP, and
  - Invasive Plant Monitoring SOP;
- TL Conceptual Reclamation Plan (TL CRP);
- TL Vegetation and Access Management Plan (TL VAMP)
- Wildlife Mitigation and Monitoring Plan (WMMP);
- Wetland Management and Offsetting Plan (WMOP);
- Chemicals and Materials Storage, Transfer and Handling Plan (CMSTHP);
- Mine Site Traffic Control Plan (MSTCP);
- Occupational Health and Safety Program; and
- Mine Emergency Response Plan (MERP).

3.0 Roles and Responsibilities

BW Gold has an obligation to meet previous commitments and delegate responsibilities associated with those commitments to mine personnel and site contractors during all phases of the mine life. A clear understanding of the roles, responsibilities, and level of authority that employees and contractors have when working at offsite infrastructure such as the Transmission Line as addressed by this plan, is essential to meet EMS objectives.

Table 3-1 provides an overview of general environmental management responsibilities during TL construction for key positions that will be involved in environmental management. Other positions not specifically listed in Table 3-1 that will provide supporting roles include independent Environmental Monitors, other qualified persons, and Qualified Professionals (QPs).

Table 3-1: Blackwater Gold Roles and Responsibilities

Position	Responsibility
Chief Executive Officer (CEO)	The CEO is responsible for overall Project governance. Reports to the Board.
Chief Operating Officer (COO)	The COO is responsible for engineering and Project development and coordinates with the Mine Manager to ensure overall Project objectives are being managed. Reports to the CEO.
Vice President (VP) Environment & Social Responsibility	The VP is responsible for championing the Environmental Policy Statement and Environmental Management System (EMS), establishing environmental performance targets and overseeing permitting. Reports to the COO.
General Manager (GM) – Development	The GM is responsible for managing Project permitting, the Project's administration services and external entities, and delivering systems and programs that ensure Artemis's values are embraced and supported: Putting People First, Outstanding Corporate Citizenship, High Performance Culture, Rigorous Project Management and Financial Discipline. Reports to the COO.
Mine Manager	The Mine Manager, as defined in the Mines Act, has overall responsibility for mine operations, including the health and safety of workers and the public, EMS implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the GM.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. Reports to the GM.
Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement, and Construction contractor, other contractors, the Company and regulatory agencies, where required. Supports the CM and reports to the Mine Manager.
Departmental Managers	Departmental Managers are responsible for implementation of the EMS relevant to their areas. Report to the Mine Manager.

Position	Responsibility
Indigenous Relations Manager	Indigenous Relations Manager is responsible for Indigenous engagement throughout the life of mine. Also responsible for day-to-day management and communications with Indigenous nations. Reports to the EM.
Community Relations Advisor	Community Relations Advisor is responsible for managing the Community Liaison Committee and Community Feedback Mechanism. Reports to the Mine Manager.
Environmental Monitors	Environmental Monitors (includes Environmental Coordinators and Technicians) are responsible for tracking and reporting on environmental permit obligations through field based monitoring programs. Report to the EM.
Aboriginal Group Monitors	Aboriginal Group Monitors are required by EAC #M19-01 Condition 17 and will be responsible for monitoring the Project's potential effects on Indigenous interests. Aboriginal Group Monitors will be involved in adaptive management and follow-up monitoring programs. Report to the EM.
Employees and Contractors	Employees and contractors are trained and are responsible for being aware of permit requirements specific to their roles and responsibilities. Report to the Departmental Managers.
Qualified Professionals and Qualified Persons	Qualified professionals and qualified persons will be retained to review objectives and conduct various aspects of environmental and social monitoring as specified in Environmental and Social Management Plans.

BW Gold will employ a qualified person as Environmental Manager (EM) who will ensure that throughout the TL Construction phase, the EMS requirements are established, implemented and maintained, and that environmental performance is reported to management for review and action. The EM is responsible for retaining the services of qualified persons or QPs with specific scientific or engineering expertise to provide direction and management advice in their areas of specialization. The EM will be supported by a staff of Environmental Monitors that will include Environmental Specialists and Technicians and a consulting team of subject matter experts in the fields of environmental science and engineering.

During the TL construction, the EPC Contractor and subcontractors will report to the CM. The EPC Contractor will be responsible for ensuring that impacts are minimized, and environmental obligations are met during construction. For non-EPC contractors, who will perform some of the minor works on site, the same reporting structure, requirements, and responsibilities will be established as outlined above. BW Gold will maintain overall responsibility for management of the construction phase of the TL and will therefore be responsible for establishing employment and contract agreements, communicating environmental requirements, and conducting periodic reviews of performance against stated requirements.

The CM is accountable for ensuring that environmental and regulatory commitments/obligations are being met during construction. The EM will be responsible for ensuring that construction activities are proceeding in accordance with the objectives of the EMS and associated management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and EPC contractor, other contractors, the Company, and regulatory agencies, where required. The EM or designate will have the authority to stop any construction activity that is deemed to pose a risk to the environment and work will only proceed when the identified risk has been addressed and concerns rectified.

The EM will be supported by the VP of Environment and Social Responsibility in order to provide an effective and integrated approach to environmental management and ensure adherence to corporate environmental standards. The EM will be accountable for implementing the approved management plans and reviewing them periodically for effectiveness.

Environmental management during construction of the TL will be integrated under the direction of the EM. Pertaining to this TL CEMP specific personnel will have defined responsibilities defined below.

The Construction Manager will be responsible for:

- Overall ownership of the TL CEMP; and
- Participation in Project meetings.

The EM will be responsible for:

- Implementation of compensation and offsetting programs;
- Coordination of the monitoring program in association with the Environmental Monitor or relevant QPs;
- Plan revisions; and
- External reporting.

The Environmental Monitor will be responsible for:

- Review and/or establishment of no-work boundaries around any sensitive areas in the proximity of construction activities in advance of the start of work;
- Inspect the work for compliance with the TL CEMP and relevant federal/provincial environmental regulations or Project-specific permit conditions;
- Participation in Project meetings; and
- Internal reporting.

The EPC contractor will be responsible for:

- All aspects of the work which have the potential to impact the environment;
- Adherence to relevant federal/provincial legislation and Project-specific permit conditions as they pertain to the scope of work;
- Implementation of all construction mitigation/management measures unless otherwise noted;
- Fuel management and spill response;
- External reporting; and
- Participation in Project meetings and reporting.

Pursuant to Condition 19 of the EAC #M19-01, Conditions A(10)(a-c) of the M-246 *Mines Act Permit*, Condition 3.7 of *Environmental Management Act* Permit #110652, BW Gold has established an Environmental Life of Mine Monitoring Committee (ELoMC) to facilitate information sharing and provide advice on the development and operation of the Project, and the implementation of EAC conditions, in a coordinated and collaborative manner. Committee members include representatives of the Environmental Assessment Office (EAO), UFN, LDN, NWFN, StFN, SFN, NFN, BC EMLI, BC ENV, and BC MOF/WLRS.

Pursuant to Condition 17 of the EAC #M19-01, Aboriginal Group Monitor and Monitoring Plan, BW Gold will retain or provide funding to retain a monitor for each Indigenous nation defined in the EAC #M19-01 prior to commencing construction of the TL and during the TL's active maintenance activities and

decommissioning. The general scope of the monitor's activities will be related to monitoring for potential effects from the TL on the Indigenous nations' interests.

The TL EPC contractor roles and responsibilities relating to environmental management, industrial and domestic waste management, and environmental protection are identified below in Table 3-2.

Table 3-2: Transmission Line Construction Contractor Roles and Responsibilities

Role	Responsibility
Contractor Construction Manager (CCM)	The CCM has ultimate responsibility for construction proceedings, including worker and public health and safety and environmental protection. The CCM will ensure the implementation of training programs as well as support the Blackwater Gold Environmental Policy. The CCM will ensure that adequate support and resources are made available for the implementation and maintenance of the Environmental Management System, including the management plan implementation and review. The CCM may, as needed, delegate their duties to Qualified Professionals who will report to the BW Gold Construction Manager.
Contractor Construction Superintendent	The Contractor Construction Superintendent will have an administrative responsibility and requirement to act upon the directions, guidance, and support of the CCM. They are resources to the CCM, and have the following responsibilities: • Support the implementation of the Blackwater Gold Environmental Policy; • Ensure that environmental matters are given consideration in pre-planning of construction activities, budgets, training, and operations; and • Ensure that workers under their supervision are made aware of known, or reasonably foreseeable, environmental aspects where they work.
Construction Employees, Contractors, and Subcontractors	Employees have general responsibilities for environmental protection, which include: • Supporting the Blackwater Gold Environmental Policy; • Supporting implementation of Environmental Management Plans; • Cooperating with the Blackwater Environmental Life of Mine Committee representative(s); • Learning and following environmental best practices and procedures relevant to their work; • Following instructions and directives given by supervisors; • Operating equipment in an environmentally responsible manner to avoid environmental impacts; • If training another worker, ensuring that they are properly completing all required tasks and responsibilities in accordance with environmental best practices procedures; • Reporting all environmental incidents immediately to their supervisor, who will expedite a response to address the incident; • Participating in mitigating or minimizing harm to the environment should an environmental incident occur; and • Asking for help or information when unsure how to perform a task without compromising social, cultural, archaeological, or environmental values.

4.0 Compliance Obligations, Guidelines, and Best Management Practices

4.1 Legislation and Regulations

Federal legislation that may be applicable to the TL CEMP includes:

- *Canadian Environmental Protection Act, 1999;*
  - On-road Vehicle and Engine Emission Regulations, and
  - Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations;
- *Explosives Act;*
  - Explosives Regulation;
- *Fisheries Act;*
  - Authorizations Concerning Fish and Fish Habitat Regulations;
- *Impact Assessment Act;*
- *Migratory Birds Convention Act, 1994;*
- *Navigable Waters Protection Act;*
- *Seeds Act;*
- *Species at Risk Act;*
- *Transportation of Dangerous Goods Act;*
  - Transportation of Dangerous Goods Regulations; and
- *United Nations Declaration on the Rights of Indigenous Peoples Act.*

Provincial legislation that may be applicable to the TL CEMP includes:

- *Building Act;*
  - British Columbia Building Code Regulation,
  - British Columbia Fire Code Regulation, and
  - Building Act General Regulation;
- *Declaration on the Rights of Indigenous Peoples Act;*
- *Environmental Assessment Act;*
- *Environmental Management Act;*
  - Contaminated Sites Regulation,
  - Hazardous Waste Regulation,
  - Open burning Smoke Control Regulation,
  - Petroleum Storage and Distribution Facilities Storm Water Regulation,
  - Spill Reporting Regulation,
  - Spill Preparedness Response and Recovery Regulation, and
  - Waste Discharge Regulation;

- *Forest Act;*
- *Forest and Range Practices Act;*
  - Forest Planning and Practices Regulation, and
  - Invasive Plants Regulation;
- *Forest Practices Code of British Columbia Act;*
- *Heritage Conservation Act;*
- *Integrated Pest Management Act;*
  - Integrated Pest Management Regulation;
- *Land Act;*
- *Land Title Act;*
- *Mines Act* (within *Mines Act* permit area);
  - Health, Safety and Reclamation Code for Mines in British Columbia (BC EMLI 2022);
- *Transport of Dangerous Goods Act;*
  - Transport of Dangerous Goods Regulations;
- *Water Sustainability Act;*
- *Weed Control Act;*
  - Weed Control Regulation;
- *Wildfire Act;*
  - Wildfire Regulation;
- *Wildlife Act; and*
  - *Wildlife Act* Permit Regulation;
- *Workers Compensation Act.*
  - Occupational Health and Safety Regulation.

Key provincial and federal authorizations that are required or are yet to be confirmed for TL construction are provided in Table 4.1-1.

Table 4.1-1: Likely Authorizations Required for the Transmission Line

Legislation	Authorization	Authorization Purpose
Provincial		
Land Act	Licence of Occupation Statutory Right Of Way	Authorizes occupancy and use of Crown land
Forest Act	Occupant Licence(s) to Cut	Authorizes Crown timber harvesting
	Road Use Permit(s)	Authorizes use of FSRs
Heritage Conservation Act	Permits (Archaeological Impact Assessment [AIA]/site alteration)	Authorizes site alteration and inspection

Legislation	Authorization	Authorization Purpose
Forests Practices Code of BC Act	Temporary use permit	Temporary access roads
Land Title Act	Easement	Authorizes occupancy and use of private land
Safety Standards Act	Permit	Connect a powerline
Water Sustainability Act	Approvals/Notifications	Changes in or about a stream
	Short Term Licence	Water withdrawal for use during construction
Wildlife Act	Licence	Designate no shooting area
	WMA Authorization	Authorization to cross the Stellako WMA
	Salvage Permits	Relocate wildlife during construction
Federal		
Migratory Birds Convention Act (Section 5)	N/A	Authorizes periods during which migratory birds may be (killed/captured) and their nests or eggs (destroyed)
Navigable Waters Protection Act	Approval	Crossing of Navigable Waters
Species at Risk Act (Section 32 and 33)	Permit	Provides for protection of listed species in accordance with regulations
Transportation of Dangerous Goods Act	Permit	Transport of dangerous goods

4.2 Environmental Assessment Certificate and Federal Decision Statement Conditions

The TL CEMP addresses EAC Condition 13 and federal Decision Statement (DS) Conditions 2.1 to 2.4. Concordance tables identifying where the EAC and DS requirements are in the TL CEMP are provided in Appendix A and Appendix B respectively.

4.3 Existing Permits

BW Gold received *Mines Act* Permit M-246 on June 22, 2021, authorizing early construction works (Early Works) within a permitted area encompassing 1,018.9 hectares (ha) at the mine site. *Environmental Management Act* Authorization 110662 authorizes discharges associated with the Early Works and Special Use Permit SP0001 authorizes construction of the Mine Access Road. The Occupant Licence to Cut accompanying *Mines Act* Permit M-246 did not include authorization to cut the TL corridor within the mine site. BW Gold received an amended *Mines Act* Permit M-246 on March 8, 2023, approving the Mine Plan and Reclamation Program and superseding the previous version. On May 2, 2023, BW Gold received

Environmental Management Act Permits PE-110650 authorizing discharge of air contaminants to the atmosphere and PE 110652 authorizing discharge of effluent to surface water and groundwater from the Blackwater mine.

As such, there are no existing permit conditions associated with the TL. This TL CEMP will be updated once all permits are in place to incorporate relevant conditions, as required.

4.4 Guidelines and Best Management Practices

Guidelines and best management practices that have informed the development of the TL CEMP include:

- Developing a Construction Environmental Management Plan for Mines in British Columbia (BC MEMPR 2019);
- Riparian Management Area Guidebook (BC MOF 1995);
- Forested Wetlands-Functions, Benefits, and the Use of Best Management Practices (Welsch et al. 1995);
- Archaeological Impact Assessment Guidelines (BC SBTC 1998);
- Traffic Control Manual for Work on Roadways (BC MOT 1999);
- Engineering Section Report: Construction Noise (WCB 2000);
- A Field Guide to Fuel Handling, Transportation, and Storage (BC MWLAP 2002);
- Invasive Plant Prevention Guidelines (Clark 2003);
- British Columbia Field Sampling Manual (BC MWLAP 2003);
- Terms and Conditions for Changes in and about a Stream Specified by MOE Habitat Officers, Omineca Region (BC FLNRO 2004);
- BC Hazardous Waste Legislation Guide (BC MOE 2005a);
- Best Management Practices for Raptor Conservation during Urban and Rural Land Development in British Columbia (BC MOE 2005b);
- Handbook for Pesticide Applicators and Dispensers (BC MOE 2005c);
- Wetland Ways: Interim Guidelines for Wetland Protection and Conservation in British Columbia (Cox and Cullington 2009);
- Invasive Alien Plant Program: Reference Guide (BC MOFR 2010a);
- Invasive Plant Chemical and Mechanical Treatment Record (BC MOFR 2010b);
- Pest Management Plan for Invasive Alien Plants on Provincial Crown Lands in Central and Northern British Columbia (BC MOFR 2010c);
- Yinka Dene ‘Uza’hne Guide to Surface Water Quality Standards, Version 4.1 (Nadleh Whut’en and Stellaten 2016a);
- Yinka Dene ‘Uza’hné Surface Water Management Policy (Nadleh Whut’en and Stellat’en 2016b);
- Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines for the Protection of Aquatic Life (CCME 2011);
- Fish-stream Crossing Guidebook BC (FLNRO 2012);

- Environmental Code of Practice for Metal Mines (EC 2012);
- BC Ambient Air Quality Objectives and Standards (BC MOE 2013);
- Best Practices for Preventing the Spread of Invasive Plants During Forest Management Activities: a Pocket Guide for British Columbia's Forest Workers, 2013 Edition (BC FLNRO and ISCBC 2013);
- A Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia (BC FLNRO 2014);
- Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia (BC MOE & BC FLNRO 2014);
- Develop With Care, Environmental Guidelines for Urban and Rural Land Development in British Columbia (BC MOE 2014a);
- Management Plan for the Western Toad (Anaxyrus boreas) in British Columbia (BC MOE 2014b);
- Best Management Practices for Amphibian and Reptile Salvages in British Columbia (BC FLNRO 2016);
- Best Management Practices for Bats in BC (Holroyd and Craig 2016);
- Cariboo Chilcotin Coast Invasive Plant Committee Regional Strategic Plan. Version 3.1 (CCCIPC 2017);
- Fossil Management Framework (BC Fossil Management Office 2017);
- Best Practices for Managing Invasive Plants Along Roadsides: A Pocket Guide for British Columbia's Maintenance Contractors (ISCBC 2019);
- Fish and Fish Habitat Protection Policy Statement (DFO 2019a);
- Measures to Protect Fish and Fish Habitat (DFO 2019b);
- Guidelines to Reduce Risk to Migratory Birds (EC 2019);
- Interim Code of Practice: Temporary Stream Crossings (DFO 2020);
- Invasive Plant Pest Management Plan for Provincial Public (Crown) Lands in the Southern Interior of British Columbia (BC FOR 2020);
- Interim Code of Practice: End-of-Pipe Fish Protection Screens for Small Water Intakes in Freshwater (DFO 2021);
- Field Guide to Noxious Weeds and Other Selected Invasive Plants of British Columbia, 12th Edition (ISCBC 2021);
- Forest Road Engineering Guidebook (BC MOF 2002); and
- Integrated Vegetation Management Plan for BC Hydro Transmission and Distribution Power Line Corridors (BC Hydro 2016).

4.5 Compensation and Offsetting Programs

In accordance with the federal DS and EA Certificate issued for the Project, compensation/offsetting plans have been prepared to mitigate Project impacts to fish and fish habitat (DS Condition 3.11), wetlands (DS Condition 5.3 and EAC Condition 24) and southern mountain caribou (DS Condition 8.18 and EAC Condition 22).

While development and implementation of these compensation programs (as distinct Project-level mitigation measures) are largely outside of the scope of this TL CEMP, they are included here for completeness as they are key mitigations to offset for project impacts. Summaries of these plans are provided below. The fish and fish habitat offsetting program is not relevant to the TL and not discussed herein.

4.5.1 Wetlands

EAC Condition 24 and DS Condition 5.3 require BW Gold to develop a Wetlands Management and Offsetting Plan prior to construction, in consultation with Indigenous nations, FOR and Environment and Climate Change Canada (ECCC). The WMOP (ERM 2022) is intended to offset the Project's impacts on wetland functions during the Construction, Operations, and Closure phases. The development of the plan must take into account Canada's Federal Policy on Wetland Conservation (Environment Canada 1991), Canada's Operational Framework for Use of Conservation Allowances (Environment Canada 2012b), and habitat needs for migratory birds, moose and listed species at risk.

BW Gold initiated pre-construction wetland surveys within the Certified Project Description (CPD) boundary (with the exception of the transmission line which was surveyed in 2017) during the summer and fall of 2021 to fulfill DS Condition 5.5.1. The planned 2022 field studies were completed to provide a detailed description of each wetland that will be lost or altered in support of selecting the preferred wetland offsetting site..

Currently the Mathews Creek wetland complex is the primary wetland offsetting site (see Section 10 of the WMOP). The wetland complex was selected as a compensation site because it is in close proximity to watersheds and waterbodies being affected by the project and it is within the territories of the Indigenous nations (LDN and UFN) where the majority of impacts to wetlands is occurring. Furthermore, there is synergistic properties and holistic ecosystem-level gains to come from multiple forms of offsetting happening within the same complex (e.g. bats, wetlands and fish). Finally, considerable opportunity for restoration activities exists because there has been intensive agriculture and livestock grazing in the area for the last 50+ years. Wetland disturbance along the middle reaches of Mathews Creek, due to cattle ranching and drainage ditch excavation, have resulted in lowered water tables, altered wetland vegetation, soil rutting, and erosion of riparian areas (Application/EIS 5.3.7A – Wetland Compensation Plan).

Table 4.5-1: Summary Table of Wetlands within the Right-of-Way

Wetland Type	Area (ha)
Fl05	0.80
RI	0.07
Wb01	0.44
Wb05	2.90
Wb08	0.69
Wf01	1.38
Wf02	1.66
Wf07	0.06
Wf08	0.07

Wetland Type	Area (ha)
Wm01	0.45
Ws00	0.06
Ws04	2.44
Ws07	10.70
Ws08	0.18
Ww	0.23
Total	22.13

4.5.2 Caribou

The mine site overlaps the eastern boundary of the Tweedsmuir local population unit (LPU) of mountain caribou (*Rangifer tarandus caribou*). The LPU is listed as threatened under Schedule 1 of the *Species at Risk Act*, a special concern by Committee on the Status of Endangered Wildlife in Canada, and blue-listed by the province.

BW Gold has developed a Caribou Mitigation and Monitoring Plan (ERM 2022b) to avoid, reduce, and offset the Project's adverse effects on caribou and its critical habitat. While BW Gold acknowledges potential uncertainty, the weight of evidence indicates that the Project will not interact with caribou or consistently occupy caribou habitat. This result notwithstanding, BW Gold recognizes that the Project will have a residual effect on caribou habitat in the Tweedsmuir LPU and concerns that underscore recent declines, primarily associated with natural disturbances and forestry across the Tweedsmuir LPU. As a result, BW Gold is taking a conservative approach and proposing a habitat securement-based offsetting plan for caribou habitat as well as non-habitat measures as described in the August 12, 2021 Caribou Mitigation and Monitoring Plan.

As part of the habitat-based offsetting measures, BW Gold committed to offset for impacts at an offsetting ratio of 5:1. The habitat-based offset is proposed to include a land securement within BW Gold's mineral tenures and restoration within the land securement. The non-habitat measures are not intended to specifically address the Project's residual effects on caribou habitat loss and alteration, but rather act as a commitment by BW Gold to collaborate on caribou stewardship initiatives with Indigenous nations and provincial and federal governments.

4.5.3 Bats

Where pre-construction surveys identify the loss of little brown myotis and northern myotis roosting habitat, the loss will be offset through installation of new roosting structures within suitable habitat (Wildlife Mitigation and Monitoring Plan; ERM 2022c).

Following DS 8.15, and recommendations from ECCC, BW Gold will implement mitigation to avoid effects on bat habitat and restore habitat, following the mitigation hierarchy:

- Retain trees or stands that may support bat roosts;
- Retain key bat habitat resources where possible;
- Restore disturbed habitat - restoration will be addressed through the Reclamation and Closure Plan;

- Augment habitat;
- Where protected and/or restoration habitat areas for other wildlife (e.g., caribou, migratory birds, western toads) have been identified as offsets, implement measures beneficial to bats within these areas (e.g., Capoose HE-UWR, caribou and wetland restoration areas); and
- Install roosting structures.

Call surveys and identification of potential bat hibernacula and roosts during the completion of other pre-construction surveys was conducted during the summer of 2021. Identification of roost (wildlife tree) and hibernacula (cave or crevice) features was done during habitat suitability surveys for other species within the transmission line LSA; observers including qualified professionals and Indigenous assistants searched all habitat suitability plot areas for wildlife signs and features. No potential hibernacula were identified. Wildlife trees which may serve as bat roosts were recorded incidentally, but none were within TL RoW.

In both their February 28, 2022 letter and a subsequent letter on May 2, 2022, ECCC and representatives from LDN and UFN indicated that they preferred the use of Brandenbark as a roosting structure and did not support the use of bat boxes. Therefore, roosting structures (Brandenbark) will be installed in the vicinity of lost roosting structures. Roosting structures will be installed prior to construction of the Transmission Line.

Plans for distribution and timing of constructing roosting offsets will remain flexible based on construction progress each year.

5.0 Adaptive Management Framework

The TL CEMP is a living document that will evolve during the Construction phase in response to monitoring results. The TL CEMP incorporates adaptive management as follows:

- **Plan**
  - Identify compliance obligations;
  - Identify pre-construction requirements (e.g., pre-clearing surveys) through application of appropriate and applicable risk windows for fish, wildlife, birds, etc.;
  - Provide a framework for environmental risk management;
  - Provide a spill response framework and equipment inventory;
  - Establish records database; and
  - Prepare monitoring schedules.
- **Do**
  - Conduct pre-construction and pre-clearing surveys subject to timing windows;
  - Develop site orientation and training procedures; and
  - Identify record keeping procedures and logs.
- **Monitor**
  - Conduct monitoring;
  - Complete and maintain monitoring records; and
  - Report on findings or incidents.
- **Adjust**
  - Review effectiveness of mitigation measures;
  - Identify new and/or alter mitigation measures based on review of plan measures and incorporate into monitoring program and reporting; and
  - Revise the TL CEMP including Environmental Alignment Sheets as new and/or altered measures are introduced.

6.0 Transmission Line Schedule

The TL schedule is presented in Table 6-1, which includes an overview of the facility's lifecycle.

Table 6-1: Transmission Line Schedule

	Activity	Timeline	Responsible Party
Pre-Construction	• Environmental field work as required • Pre-Clearing Surveys • Final surveys • Construction team orientation / training	3 months (may overlap with construction)	BW Gold Consultants
Construction	• Minor upgrades to existing, non-status roads • Timber harvesting / clearing • Access road construction (within the TL RoW) • Structure installation • Conductor stringing • Monitoring and reporting	14 months	EPC Contractor
Post-Construction Reclamation	• Reclaim and/or decommission temporary access trails on RoW • Monitoring and reporting	Up to 3 years post-construction	BW Gold
Operation	• Periodic inspections and maintenance of poles and guy wires • Repair and maintenance following unscheduled power supply interruptions • Vegetation management • Monitoring and reporting	45 years+ (currently assumed perpetuity)	BW Gold
Closure	• De-energizing TL • Removal of mine site substation • Disconnection from Glenannan Substation • Removal of conductors and structures • Reclamation of the RoW and any remaining access roads • The majority of power line structures will be removed, although wood poles near creeks or wetlands may be retained to provide nesting habitat for raptors • Monitoring and reporting	1 year	BW Gold

Note: TL RoW = Transmission Line right of way

6.1 Construction Workforce Management

Workforce management will be based on an EPC approach where the EPC Contractor will oversee the delivery of the completed Project from detailed engineering, procurement, and construction to handover of working facility. The EPC Contractor will engage and coordinate subcontractors to complete all work within the given scopes. Workforce scheduling will be closely coordinated between BW Gold construction personnel and the EPC Contractor.

7.0 Environmental Setting

Extensive baseline studies were undertaken to support the Project EAC application (Application/EIS; New Gold 2015), and environmental studies have continued since the issuance of the federal and provincial EA decisions. Detailed descriptions of the environmental and social baselines are provided in the Application/EIS as well as the Effects Assessment of Proposed Change to TL Alignment Addendum Report (New Gold 2017). Environmental setting map sheets were included in Appendix A of the TL IPD (BW Gold 2022).

Detailed Environmental Alignment Sheets will be developed prior to construction and issued as part of the IFC drawing package. The sheets are anticipated to include land ownership, fisheries resources, riparian areas, old growth forest, traditional use plant habitat, wetlands, wildlife, and historical/heritage features and incorporate the most recent survey data from the 2021 and 2022 seasons. These will be fully integrated into the IFC package and Construction Execution Plan.

Baseline studies were completed along a 140 m wide corridor, identified in the EAC as the CPD. The proposed TL RoW (40 - 50 m width) is entirely within the approved CPD. A summary of environmental values within the CPD most relevant to the interaction with TL construction is provided in the sections below.

7.1 Vegetation

The transmission line is within the Nazko Upland Ecosection of the Fraser Plateau in the Sub-Boreal Spruce Biogeoclimatic Zone. Low-elevation valley bottoms are dominated by stands of lodgepole pine. Hybrid white spruce tends to dominate on moist to wet sites below 1,500 m, while subalpine fir and Englemann spruce are dominant above 1,500 m. Lodgepole pine is a major species on dry, fire-prone sites at most elevations. The pine beetle epidemic infested almost all of the lodgepole pine forests within this sub-region. Bio-geoclimatic (BGC) units within the transmission line include: SBSdk (Dry Cool Sub-Boreal Spruce subzone); SBSdw3 (Stuart Dry Warm Sub-Boreal Spruce variant); SBSmc2 (Babine Moist Cold Sub-Boreal Spruce variant); SBSmc3 (Kluskus Moist Cold Sub-Boreal Spruce variant); and ESSFmv1 (Nechako Moist Very Cold Engelmann Spruce-Subalpine Fir variant).

Sensitive terrestrial ecosystems within the TL corridor include riparian area (37.7 ha) sparsely vegetated area (0.3 ha), old growth forest (41.5 ha), and traditional plant use habitat (224.7 ha). There are no ecosystems at risk along the TL alignment. Recent rare plant surveys conducted in 2017 did not indicate the presence of rare or listed plant species, including whitebark pine.

Further details of the vegetation baseline can be found in ERM 2017a.

Seventy-nine wetlands have been identified within the TL corridor of which nine wetlands are blue-listed, three of which are proposed to be crossed. A tabular listing of wetlands within the TL corridor, including location and area calculations, is presented in Appendix I.

7.2 Fish, Fish Habitat, and Aquatic Resources

The major watercourse crossings and associated span lengths are presented in Table 7.2-1. Baseline studies indicated that rainbow trout was the most common species observed or captured during field sampling along the proposed TL and access road corridors. Other species identified during sampling included brassy minnow, lake chub, and white sucker. No anadromous fish were captured, although there are records of Chinook salmon and sockeye salmon in the Nechako and Stellako Rivers.

Table 7.2-1: Major Watercourse Crossing Width and Span

Major/Creeks	Right-of-Way Width at Crossing (m)	Span Length (m)
Stellako River	40	326.4
Smith Creek	40	227.5
Fifteen Creek	40	175.6
Nechako River	43	285.3
Targe Creek	40	225.8
Cutoff Creek	50	368.2
Big Bend Creek	50	269.8
	40	325.2
	41	299.4
Esker Creek	41	168.7
Davidson Creek*	40	268.3
Chedakuz Creek	41	198.7

**Note: Davidson Creek crossing occurs within the Mine Site boundary*

The closest species at risk include:

- A population of white sturgeon (*Acipenser transmontanus*), present in the middle reaches of the Nechako River;
- Nechako Chinook are part of the Mid-Fraser Summer Chinook Conservation Unit that was recently designated by COSEWIC as Threatened; and
- Francois-Fraser-S DU Sockeye is designated as Special Concern by COSEWIC and known spawning habitat is located at the Stellako River Crossing (WC-8).

Riparian vegetation at stream crossings is variable and largely dependent on soil moisture and surrounding forestry activity. Riparian tree species common to most sites include hybrid white spruce, lodgepole pine, and true fir, and common shrubs include black twinberry, willow, and alder. Most of the mature pine is dead standing timber as a result of the recent mountain pine beetle infestation. Dead timber has contributed to notable blowdown across many stream channels, causing impediments to potential navigation and fish passage.

Further details of the fish and fish habitat baseline can be found in ERM 2017b.

7.3 Cultural Resources

Archaeological Impact Assessments (AIA) and desktop studies have been completed along the original TL as part of the Application/EIS Application process and supplemental submissions. BW Gold recently completed the first phase of an additional AIA focused on portions of the alignment not captured in

the original AIA. The results have been partially received and the AIA is anticipated to be completed in Q3 2022.

Further details of the cultural resources baseline can be found in ERM 2017c.

7.4 Wildlife and Wildlife Habitat

Wildlife species at risk detected during targeted wildlife surveys in 2017 included horned grebe, common nighthawk, and western toad. Common nighthawk was recorded in a variety of upland and wetland habitats along the alignment. Horned grebe were identified twice during aerial waterbird surveys. Western toad was recorded at eight different survey sites, and breeding activity for the species was recorded at six locations.

Additional species of conservation concern identified during surveys were olive-sided flycatcher, rusty blackbird, barn swallow, sharp-tailed grouse, and common nighthawk.

The TL corridor is outside the Tweedsmuir Local Population Unit and in Type 2 matrix range and therefore encounters with caribou are highly unlikely.

Further details of the wildlife and wildlife habitat can be found in ERM 2017d.

7.5 Current Use for Traditional Purposes

The TL alignment is located within the traditional territories of UFN, LDN, STN, TN, Cheslatta Carrier Nation as well as the traditional territories of the CSFNs. Current known traditional uses within the area include plant gathering (Messue Wagon Trail and other trails), fishing, hunting, and trapping.

Further details on use of lands and resources for traditional purposes can be found in ERM 2017e.

7.6 Current Use for Non-Traditional Purposes

No provincial or federal parks, protected areas, or *Land Act* “Environment, Conservation and Recreation” Crown land parcels are crossed by the TL alignment. One wildlife management area designated under the *Wildlife Act* (the Stellako River Wildlife Management Area) is crossed at the Stellako River. No recreation sites are crossed. In collaboration with the CSFNs and to respond to FOR comments, the alignment was adjusted to avoid the Cut-Off Creek Recreation Site (REC1097), Cabin Creek Falls Recreation Site (REC16064) and the Cabin Creek Falls Trail (REC4106).

The following land tenure types and private lands are crossed by the TL and will be identified on the Environmental Alignment Sheets:

- 25 mineral tenures;
- 18 forestry tenures;
- 4 range tenures;
- 6 guide certificates;
- 16 traplines;
- 2 quarrying (aggregate) reserve notations;
- 9 utility reserve notations, 4 utility statutory RoW;

- 2 parcels of private property; and
- 6 other *Land Act* tenures (agriculture, residential, investigative).

Recreational use in the region includes hunting, fishing, all-terrain vehicle use, snowmobiling, hiking, camping, cross-country skiing, horseback riding, fishing, hunting, interpretive cultural heritage experiences, and ecotourism. Subject to restrictions, there are open hunting seasons for mule deer, white tailed deer, moose, black bear, wolf, cougar, coyote, lynx, snowshoe hare, ruffed and spruce grouse, ptarmigan, ducks, and geese.

Guide Outfitters bring guided non-resident hunters into the region, primarily during hunting seasons in the fall (September to October) and spring (April - June). Some guides operate by motor vehicle and by non-motorized (horseback) means depending on the boundary of the Semi-Primitive Non-Motorized vehicle designation within the FOR Vanderhoof Access Management Plan.

Other tenure holders have varying degrees of use and presence within their tenure area seasonally or year-round, depending on the specific resource activity.

8.0 Risk Management

Environmental risk is managed by applying reduced risk or timing windows for fish and wildlife species. These windows often overlap throughout most of a calendar year when multiple fish and wildlife species are considered. Therefore, BW Gold proposes to use a risk-based approach if TL construction activities outside of least risk windows is unavoidable, subject to regulatory requirements and the implementation of additional mitigation measures.

With respect to known heritage resource values, the *Heritage Conservation Act* provides automatic protection for artifacts, features, materials, or other physical evidence of human habitation or use on or before 1846 as well as petroglyphs, petroforms, heritage wrecks, and burials regardless of age. Given the protection provided by the *Heritage Conservation Act*, these values are not considered in the risk management approach described below. The Transmission Line Archaeological Management and Impact Mitigation Plan describes measures to mitigate impacts on known and unknown archaeological and cultural heritage resources.

8.1 Decision Hierarchy

Table 8.1-1 provides an example of the decision hierarchy that BW Gold will implement to guide construction planning and the mitigation measures that will be implemented. This hierarchy is based on relative strength of legislation and guidance, among other factors (such as cultural importance). In the hierarchy, a valued component with a ranking of “1” would take precedent over a valued component with a ranking of “2” or “3”.

Table 8.1-1: Risk Management Ratings

Value	Decision Hierarchy	Example Mitigation Approach
Fish and Fish Habitat	1	• Avoidance measures • Adhere to timing windows • Follow Department of Fisheries and Oceans (DFO) mitigation procedures • Fish salvage
Species at Risk (e.g., caribou)	2	• Avoidance measures in high elevation winter and summer range, matrix habitat • Monitor and temporarily stop work when caribou observed
Breeding Birds	3	• Conduct pre-clearing surveys if work planned between April 15 and August 31 • No work zones for occupied nests
Seasonal Habitat for Important/ Sensitive Wildlife	4	• Avoidance measures • Pre-construction surveys
Red-listed Ecosystems/ Wetlands	5	• Avoidance measures • Pre-construction surveys

If there is a conflict between two environmental values, the EM will apply the mitigation hierarchy to decide which value will be prioritized and identify the mitigation measure(s) that will be applied to reduce the risk to the lowest ranked environmental value possible, if necessary. Relevant Qualified Professionals will be consulted in the event that the decision hierarchy process is used. If there is a credible risk of impacts to the environment, determined by site environmental staff, the Indigenous nations will be notified or otherwise consulted. Additional Qualified Professionals such as the Independent Environmental Monitor and federal or provincial government agencies may also be consulted.

9.0 Mitigation Measures

In February 2021, a list of proposed mitigation measures to mitigate the impacts of construction and operation of the TL were distributed for comment, entitled “Blackwater Gold Project – Summary of Mitigation Measures (April 2020: updated as per EAC Condition 43)”. This section presents the measures that will be implemented during the TL construction to mitigate the environmental and socio-economic effects. Relevant environmental management plans (EMPs) support each section.

The focus for environmental management and mitigation is primarily on the construction phase as this will be the phase where impacts are the greatest. It should be noted that the EMPs are focused on TL construction and closely related activities.

Two EMPs developed to support the major works application are inclusive of the TL component of the work; these include the Wildlife Mitigation and Monitoring Plan (WMMP ERM 2021a) and the Wetland Management and Offset Plan (WMOP ERM 2021b).

9.1 General Measures

Table 9.1-1 presents general measures that will be implemented to mitigate environmental impacts and help keep employees and contractors safe during construction.

Table 9.1-1: General Mitigation Measures

Category	Mitigation/Management Measure
Timing of Works	The construction schedule will be reviewed 60 days (by the EPC Contractor) prior to the start of construction where construction has the potential to impact tenure holders.
Site Tidiness	Keep work areas clean, tidy, and organized and left in good condition.
	Remove construction debris and unused material from the work area upon completion of work to designated areas in accordance with the WMP.
	Construction material will not be stockpiled within a Riparian Management Area (RMA), in accordance with the Riparian Area Standard Operating Procedure.
Waste Management	Promote workplace cleanliness through onboarding training by reinforcing the expectation to keep areas free of uncontained refuse and placing litter, including cigarette butts, into appropriate waste containers in accordance with the TL IDWMP.
	Dispose of authorized putrescible refuse (camp waste, paper, cardboard, and lumber scraps) in a diesel-fired incinerator (mine site) as per *Environmental Management Act* Permit 106530 or as otherwise permitted in accordance with the TL IDWMP.
	Collect and dispose of recyclable material offsite in accordance with the TL IDWMP.
	Locate and secure portable sanitary facilities at least 15 m from the top bank of a watercourse.
	Remove construction debris and unused material from the work area upon completion of work in accordance with the TL IDWMP.

Category	Mitigation/Management Measure
Waste Management *(cont'd)*	Store domestic wastes (i.e., food, food-covered packaging, and other non-recyclables) in sealed, wildlife-resistant containers for disposal in accordance with the TL IDWMP.
	Store non-combustible industrial waste in designated areas for recycling or disposal of off site in accordance with the TL IDWMP.
	Collect and dispose of hazardous waste offsite in accordance with the CMSTHP (CMSTHP, Section 8.4 Transfer Offsite).
Traffic and Site Access	Restrict site access to authorized personnel (MSTCP, Section 7.4 Access Control and Security).
	Provide authorized personnel with road use training in accordance with Section 6.1 of the MSTCP.
	Use radios for road and traffic control (MSTCP, Table 7.6-1 Traffic and Vehicle Management Protocols).
	Prior to road commissioning install temporary and permanent signage as determined by the engineering design report.
	Provide authorized personnel with a current site access map for active construction areas and traffic and site access procedures that describe the rules of the road relating to workplace safety, public safety, and the protection of wildlife.
	Reinforce the rule that all vehicular traffic must yield RoW to wildlife and to use appropriate environmental incident reports to document any wildlife encounters.
	Complete formal reporting for all environmental incidents (including human-wildlife interactions where there is active deterrence and direct harm, injury, damage, or wildlife mortality occurs). The report will document the following: • A summary of the event, response action, and means of implementation; • Copies of internal and external communications; and • Follow-up monitoring results, and any adaptive management outcomes. (CEMP, Section 16.1.4; WMMP, Section 5.1.1 Incident Response Records; MSTCP, Table 7.6-1 Traffic and Vehicle Management Protocols).
	Control dust on road surfaces in accordance with Section 9.2 of the TL AQFDMP.
	Close gates properly when vehicles require access to RoW corridors on fenced and gated lands.
	Project vehicles will be restricted to the RoW and designated access roads to minimize compaction of soil.
Right-of-Way Access	Access to RoW will be managed in accordance with mitigations provided in Section 8.2 of the TL VAMP.

Category	Mitigation/Management Measure
Orientation and Training	Hold daily Tailgate Meetings in accordance with Section 8.4.4 of the Occupational Health and Safety Program.
	Provide site personnel with orientation that is appropriate for their roles and responsibilities. At a minimum, orientation topics will include: • TL CEMP • Access road use and haulage operating protocols; • No hunting / no fishing / no gathering policy; • Wildlife observation and interaction reporting procedures; • Caribou awareness program; • Bear awareness program; • Waste management procedures; • Wildlife-human interaction procedures, including management of wildlife attractants; • Wildlife sensitive locations/timing as applicable; • Hazardous material management; • Onsite waste procedures; • Erosion prevention and sediment control; • Best management practices for working in environmentally sensitive areas; • Archaeological and Cultural Heritage Chance Find Procedure; and • Emergency procedures including spill response and incident reporting.
Equipment Use	Maintain equipment in good working condition as determined by the manufacturer's recommendations. Lock and tag out equipment for servicing, repairs, tests or general maintenance. Remove unserviceable equipment from use.
	Develop or implement existing maintenance and operations procedures designed to keep machinery clean and free of excess oil and grease, and leak-free.
	Use appropriate equipment for the work.
	Use drip trays in accordance with Section 6.7.2 and 7.1 of the TL FMSCP.
	Operate equipment according to manufacturer specifications and capacities (i.e., do not overload machines).
	Equipment will not idle, unless operational requirements and ambient temperatures require engines to continue running (e.g., extreme cold conditions where there is a risk the machine may not restart) or if the equipment or vehicle is being used for refuge (e.g., warming or cooling and lunch breaks).
	Select equipment with industry standard noise abatement technology, including exhaust, and compressor/fan noise.
	Mobile equipment should arrive on site clean and free of all material, debris, and vegetation, or be cleaned in a designated location prior to unloading in accordance with the TL IVMP.
	Maintain spill response kits on mobile equipment and at active drill and water supply pump sites. Generators, pumps, and pump fuel supplies shall use absorbent mats and containment devices to contain spills in accordance with Section 9 of the TL FMSCP.

Category	Mitigation/Management Measure
Equipment Use *(cont'd)*	Prohibit use of handheld cellular communication devices (i.e., smartphones) while operating equipment.
	Monitor the efficacy of equipment and remove defective, unserviceable equipment from the site.
Geological and Terrain Hazards	Visually monitor cleared areas and cut/fill slopes after significant precipitation events (*24-hr storm events > 44 mm rain precipitation 2-Year return period)* for signs of instability or erosion in areas of terrain stability class 4 or 5.
Adverse Weather Shutdown	Monitor the weather forecast daily, and current weather conditions if applicable, to anticipate the need for scaling back planned activities or adverse weather shutdown (i.e., extreme high or low temperatures, strong winds, high rainfall or snowfall, lightning) depending on activities.
	Establish clear lines of communication to facilitate shutdown in adverse weather conditions.
	Subject to Condition 29, BW Gold Ltd. – Transmission Line Sedimentation Monitoring Plan – Framework and Guidelines Section 3.6.2, shutdown soil salvage activities during periods of ongoing or recent heavy rain.[1]

[1] *The BC Forest Safety council recognizes 100 mm/day as a standard in the resource industry for heavy rainfall.*

9.2 Erosion and Sediment Control, Drainage Control, and Water Management

The TL SEPSCP was developed to provide the erosion and sediment control, drainage control, and water management framework that will be implemented during all Project phases, including Construction. The TL SEPSCP provides the overall approach BW Gold will take; site-specific erosion and sediment control plans will be provided to the Construction Manager on the IFC drawings.

Table 9.2-1 outlines general erosion sedimentation control (ESC) measures that will be applied during TL construction. Selected mitigation measures may be applied individually or combined to arrive at the required level of ESC. For higher risk and higher consequence works, a multi-barrier approach may be utilized, in which a combination of ESC measures are utilized in series to reduce potential for sediment transport. Adaptive selection in the field will be dependent onsite conditions, schedule, and weather.

Table 9.2-1: General Sediment and Erosion Control Mitigation Measures

Category	Mitigation/Management Measure
Timing of Works	Clearing activities will be planned to coincide with periods of drier weather or frozen conditions where operationally feasible.
	Subject to Condition 29, BW Gold Ltd. – Transmission Line Sedimentation Monitoring Plan – Framework and Guidelines, avoid soil handling or equipment movement during periods heavy and/or prolonged rainfall.

Category	Mitigation/Management Measure
Avoiding and Minimizing Effects	The TL construction footprint will be minimized to the smallest area required for access, laydown, and construction.
Site Preparation	Erosion and sediment control measures shall be installed before starting construction to reduce the potential for introduction of sediment into any surface water feature (i.e., stream, pond, wetland, drain, or ditch) or watercourses in accordance with Land Development Guidelines for the Protection of Aquatic Habitat (Fisheries and Oceans Canada 1993) and Standards and Best Practices for Instream Works (BC MWLAP 2004), unless otherwise specified.
	Contingency supplies of sediment and erosion control materials shall be maintained on site and workers shall be sufficiently trained in their appropriate installation and maintenance (see Section 6.5 of the TL SEPSCP). The requirements for the amount of each product kept on site will be determined by the Environmental Manager after assessing the potential risk of sedimentation on the specific portion of the project currently being worked on.
Disturbed Soils	Areas of exposed soil sensitive to erosion will be covered and revegetated as soon as possible following construction or before winter shut down in preparation for freshet in accordance with the TL SEPSCP.
	Install down gradient sediment traps to capture runoff and allow settling.
Ditch Construction	Construct any ditches, water bars, or water diversions within the work area so they do not directly discharge sediment-laden surface flows into a watercourse or waterbody. Divert such flows to a vegetated area where flows can slowly infiltrate.
Excavated Soils	Excavated soils will be stockpiled within the area approved for Project use, away from drainage features, drains, ditches, and a minimum 10 m beyond the ordinary high water mark of any waterbody or water course.

Note: TL SEPSCP = Transmission Line Surface Erosion Prevention and Sediment Control Plan

To address EAC Condition 29, a separate but related document entitled TL SMP-FG has been prepared (see Section 15.3). The TL SEPSCP and the SMP-FG are related and non-conflicting documents that support each other in the successful implementation and monitoring of ESC plans.

9.3 Industrial and Domestic Waste Management

BW Gold supports active involvement of all site personnel and contractors in achieving the environmental goals of waste minimization, materials conservation, and recycling. The TL IDWMP has been developed to provide a plan to manage safety, industrial and domestic waste removal, and environmental risk during construction of the transmission line. The TL IDWMP does not consider tree waste as part of the management strategy, as tree waste is considered in the TL WMP. The TL IDWMP describes the management of all anticipated hazardous and non-hazardous industrial and domestic waste generated because of the TL activities.

All industrial and domestic waste will be removed from the TL RoW and deposited at an approved waste or recycling facility.

Management of the waste groups will apply a waste hierarchy procedure adopted as Project policy, as follows:

- Avoid/Reduce – take action to reduce or avoid waste generation;
- Reuse/Recycle – reuse or recycle wastes where practical; and
- Treat/Dispose of wastes appropriately – treat or dispose of waste in an environmentally responsible manner that meets regulatory requirements and manages environmental liabilities appropriately.

Only a small quality of waste generated during the TL construction activities is anticipated to be regulated as hazardous materials. This does not include waste oil or batteries. The CMSTHP was developed primarily to support the mine site but is also applicable to the small quantity of relevant hazardous waste to be generated during TL construction.

The following materials will be recycled (refer to the TL IDWMP for additional details regarding handling, storage, and transportation):

- Scrap iron and steel;
- Scrap conductors;
- Mixed recyclables include paper, cardboard, glass, tins, aluminum cans, and plastics;
- Vehicle batteries;
- General domestic use batteries;
- Fluorescent lights (tubes/CFL);
- Printer ink or toner cartridges;
- Mobile phones and electronic equipment (e-waste); and
- Metal and plastic drums that cannot be reused.

Materials will be temporarily stored in designated areas at TL laydown(s), within the RoW, prior to being backhauled offsite for final disposal.

Guidelines for the recycling/disposal of hydrocarbon wastes are also provided in the TL IDWMP. These guidelines will be updated when wastes and waste quantities are specifically characterized. At that time, wastes will be checked for potential control under the federal Transportation of Dangerous Goods (*TDG) Act* and provincial Transportation of Dangerous Goods Regulations (TDGR). For example, certain hazardous wastes such as batteries and waste oil may not be dangerous goods under the *TDG Act* and TDGR, and waste oil used for fuel must not exceed limits specified in the HWR for several substances (e.g., total arsenic, total cadmium).

The EPC Contractor will be responsible for obtaining a hazardous waste generator number if required by the anticipated quantities of hazardous wastes temporarily stored on site.

It is anticipated that there will be minimal facilities at the TL during construction. Facilities will be temporary and will be placed at designated locations within the approved TL RoW and may include a limited number of office trailers, lunchroom trailers, wash trailers and storage trailers and seacans.

Food waste and packaging will be stored in a designated location within the lunch trailers. The waste will be removed daily to minimize odours and promote hygiene. Recyclable wastes will be segregated at these locations in labelled containers for transport off site.

On site shops for the purpose of mobile vehicle maintenance are not anticipated, as vehicular maintenance will occur by means of mobile maintenance vehicles or in off site facilities.

During construction, temporary outdoor waste transfer areas (WTA) will be established at designated locations within the approved TL RoW to temporarily store inert waste materials destined for offsite disposal until a qualified Contractor(s) transports the material to the appropriate facilities. The WTAs will be designed to store only a small quantity of scrap iron and steel, scrap conductors, and mixed recyclables (no food wastes or packaging). Small quantities of hazardous or regulated wastes such as waste oil, vehicle batteries, domestic use batteries, electronic waste, and fluorescent bulbs will be stored in enclosed and lockable trailers or seacans until the waste be safely transported off site.

As TL equipment is serviced onsite, a large volume of waste oils and fluids are produced. These fluids are prohibited from being stored on site and must be transported to appropriate disposal centres in Endako or Vanderhoof (or to the bulk storage facilities at the mine site if the mine site is closer) as soon as practicable. All waste and recyclables will be transported from the site according to the provincial *TDGR* best management practices as outlined in the TL IDWMP.

9.4 Visual Impact Management

Potential impacts to visual resources as a result of construction activities are due to tree clearing, creation of new forest openings, temporary presence of heavy equipment, and development of infrastructure (including TL structures and power lines) which alter and may degrade the viewshed in publicly accessible areas. Based on the results of engagement and consultation with the public and Indigenous nations, BW Gold developed a list of measures to mitigate the potential effects of the TL on commercial and non-commercial interests and land uses. Visual impacts associated with the TL have been mitigated to the degree practicable through engineering design and infrastructure siting. Mitigation measures that will be implemented during TL construction are provided in Table 9.4-1.

Table 9.4-1: Visual Resource Construction Measures

Category	Mitigation/Management Measure
Locating TL Along Areas of Existing Disturbance	Where design, engineering, environmental and heritage constraints allowed, the location of the TL poles was selected to cluster any potential disturbance next to existing infrastructure such as roads, while maintaining safe electrical and vehicle distances.
	Deploy berms, woody debris, and/or other visual barriers in appropriate locations along the TL that may deter human access, address predator movements, and also facilitate movement and cover for wildlife as directed by a qualified professional.
	Visual impacts associated with the TL have been mitigated to the degree practicable through engineering design and infrastructure siting.
Recreational Areas, Sites, Trails, and Rivers	Provide the construction schedule to tenure holders and recreational groups (e.g., Northwest Brigade Paddling Club, nearby lodges, and the local offices of BC FOR) overlapping the Project, 30 days prior to the start of construction and resolve any issues related to access as per appropriate industry and provincial standards, guidelines, and best practices.
Artificial Light During Construction	Apply applicable BMPs to minimize the effect of artificial light during construction (i.e., minimize the amount of artificial lighting to that necessary taking into health, safety, and security considerations; direct lighting to the ground whenever possible).

Note: BMP = Best Management Practice

9.5 Noise and Vibration

The TL NVMP has been developed to minimize potential environmental effects by limiting disturbances during TL construction. Ambient noise is recognized as an issue because noise is defined as any unwanted sound, and the proposed TL will change the noise levels during construction.

The overall objective of the TL NVMP is to manage the level of noise and vibration during the TL construction to limit the impact on other resources in the TL area.

The TL NVMP outlines the environmental protection and management measures to be employed during timber harvesting, road construction/use, and transmission structure installation that have the potential to generate noise. During construction, there will be intensive activity along the TL. Different types of heavy machinery, vehicles and power generators driven by diesel engines will be utilized. Engine-related noise sources, such as combustion explosion or the release of steam at the head of some equipment, are usually secondary. The predominant sources of noise in pneumatic tools are the high-pressure exhaust and the impact of the tool bit against the material on which it acts. Welding noise is generally negligible; the main sources of noise are the generators that support the welding equipment. Helicopters will be used to string conductors at major watercourse crossings and potentially to access remote structure locations.

Table 9.5-1 provides noise management measures, grouped by activities and equipment that will help to minimize noise levels.

Table 9.5-1: Noise and Vibration Mitigation Measures

Category	Mitigation/Management Measure
Road traffic	• Speed limits will be established based on road design class, with the maximum speed limit of 50 km/h on all Project roads, unless otherwise posted. • During maintenance, check that noise abatement devices are in good order (e.g., brakes, exhaust mufflers, engine hoods) • Select vehicles with industry standard noise abatement technology, including exhaust and compressor/fan noise
Impact equipment	• Use a noise-attenuating jacket around the jackhammer.
Explosives (if required)	• Conduct blasting only during daylight hours.
Stationary equipment (compressors, generators, pumps)	• Position noisy equipment in sheltered or enclosed locations if practicable • Select and use low-noise portable ground support equipment (e.g., power generators, pumps) if practicable
Material handling equipment (crushers, concrete mixers, cranes)	• Maintain equipment in good working condition. • Equipment will not idle, unless operational requirements and ambient temperatures require engines to continue running (e.g., extreme cold conditions where there is a risk the machine may not restart) or if the equipment or vehicle is being used for refuge (e.g., warming or cooling and lunch breaks).

Category	Mitigation/Management Measure
Earthmoving equipment (trucks, loaders, dozers, scrapers)	• Machinery and equipment will be fitted with a properly maintained muffler or other noise reducing device, in accordance with manufacture specifications. • In order to mitigate noise and vibration during the construction phase, the operation of heavy equipment will only take place between 7:00am to 9:00pm while operating within 300 m of any residence(s).
Other internal combustion engine powered equipment	• Select equipment with industry standard noise abatement technology, including exhaust, and compressor/fan noise. • At manufacturer recommended intervals, check that noise abatement devices are in good order (e.g., brakes, exhaust mufflers, engine hoods). • Equipment maintenance: maintain equipment on a regular basis, replace worn parts, lubricate as required.

9.6 Wildfire Management

The TL WMP has been developed to provide a plan to manage safety, wildfire, and environmental risk during construction of the transmission line for the Blackwater Gold Project (the Project). The Plan is to prevent wildfires during the clearing and construction phases of the Project, and then manage the burning of piles after clearing is complete. The TL WMP describes how BW Gold will comply with regulatory obligations, commitments, and best management practices during this work. The TL EPC may also have their own wildfire management plans; these plans will be reviewed by BW Gold for alignment with, at a minimum, the requirements presented in this TL WMP.

As outlined in the TL WMP the environmental and protection and management requirements and measures to be employed are presented in Table 9.6-1. Table 9.6-2 identifies “high risk” activities as defined by the BC Wildfire Regulation that may be applicable to TL construction. Table 9.6-3 identifies fire watch and activity restrictions.

Table 9.6-1: Wildfire Management General Mitigation Measures

Category	Mitigation/Management Measure
Training	Fire preparedness and response will be a component of the TL orientation.
Initial Response Actions	• Initial action will be taken by the EPC Contractor to suppress any fires within 1 km of any active work on the TL; • As soon as practical, report the fire to BW Gold and the Fire Centre; and • Monitor fire weather updates at www.bcwildfire.ca.
Smoking	Smoking is only permitted on roads or landings during fire season (high hazard readings).
Appropriate Clothing	Wear appropriate clothing (i.e., No nylon or polyester fallers pants or hi-vis T-shirts – these items are extremely flammable).
Work site inspection	Inspect work site for potential fire hazards and reduce where possible (flammable material must be removed from within 3 m of stationary machinery).

Category	Mitigation/Management Measure
Fire fighting equipment	• Keep firefighting equipment on site at the active spread(s), including an appropriate water tanker during periods of high or extreme fire risk rating; • Identify where the firefighting equipment cache and closest available water tank is located during Tailgate Meetings; • Be familiar with operation of fire equipment (extinguishers, pump cans, etc.); and • The Fire Boss will have a basic understanding of fire suppression tactics and safety procedures.
Fire fighting tools	A person who carries out an industrial activity must keep, at the activity site, firefighting hand tools in a combination and type to properly equip each person who works at the site with a minimum of one firefighting hand tool. In addition to the hand tool requirements, a person conducting a high-risk activity must also keep at the activity site, an “adequate fire suppression system”.
Requirement for hand tools at all work sites	The following basic firefighting tools will be available: • One hand tool per person (shovel or pulaski); • One hand pump per three persons; and • One water delivery system if undertaking a high risk activity.
Requirement on all heavy equipment and heavy trucks	One fire extinguisher, one shovel & one pulaski or axe.
On all pickups	Above, plus one hand pump (with 18 L water).

Table 9.6-2: High Risk Activities

High Risk Activity
• Mechanical brushing; • Disk trenching; • Preparation or use of explosives; • Using fire- or spark-producing tools, including cutting tools; • Grinding, including rail grinding; • Mechanical land clearing; • Clearing and maintaining rights of way, including grass mowing; and • Any of the following activities carried out in a cut block excluding a road, landing, roadside work area, or log sort area in the cut block: – Operating a power saw; – Mechanical tree felling, woody debris piling or tree processing de-limbing; – Welding; – Portable wood chipping, milling, processing, or manufacturing; – Skidding logs or log forwarding unless it is improbably that the skidding or forwarding will result in the equipment contacting rock; and – Yarding logs using cable systems.

9.6.1 Fire Danger Class

Weather data is collected daily by the province during the fire season from the remote weather stations. The “fire danger class” is then calculated for each weather station and posted daily at approximately 3:15 pm at the following website: http://bcwildfire.ca/lprscripts/DgrCls/index/.asp?=4

It is the TL CM’s responsibility to monitor the current “fire danger class” and implement operating restrictions as required. As fire weather is collected 7 days a week, this responsibility extends into the weekend.

The EPC Contractor will have a fire watch during the times identified in Table 9.6-3 and implement the associated activity restrictions. The fire watcher must have an unobstructed view of the site of the high risk activity during the time that the fire watcher is required. Depending on the size of the worksite, number, type, location of equipment, topography, and viewpoints available, this may require more than one fire watcher.

Table 9.6-3: Fire Watch and Activity Restrictions

Fire Danger Class (Dangerous Goods Regulations (DGR)	Restriction	Duration
III (Moderate)	• After 3 consecutive days of DGR III maintain a fire watch after work for a minimum of one hour.	• Until the fire danger class falls below DGR III.
IV (High)	• Maintain a fire watch after work for a minimum of 2 hours. • After 3 consecutive days of DGR IV, cease activity between 1 p.m. and sunset each day.	• Until the fire danger class falls below DGR III. • Until the fire danger class falls to DGR III for 2 consecutive days, or until the fire danger class falls below DGR III.
V (Extreme)	• Cease activity between 1 pm and sunset each day & maintain a fire watch for a minimum of 2 hours after work. • After 3 consecutive days of DGR V cease all activity all day.	• Until the fire danger class falls below DGR IV for 2 or more days. • Until the fire danger class falls below DGR V for 3 or more consecutive days, or falls below DGR IV.

9.6.2 Wildfire Response

Any identified fires must be reported to BW Gold and the Fire Centre. If it is safe to do, so the *Wildfire Act* requires that BW Gold and their EPC Contractor action fires that start within 1 km of TL activities. If the fire is actioned, fire control must be maintained until the fire is extinguished, it becomes impracticable to continue with fire control, or an official relieves the person in writing from continuing.

Report a Wildfire: 1 800 663 5555 or *5555

The EPC Contractor crew shall take immediate control action, with the Contractor Foreman taking on the role of Fire Boss until relieved by BW Gold or by the BC Wildfire Service.

BW Gold will follow BW Gold’s Accidents and Malfunctions Communication Plan to notify Indigenous Nations for any BW Gold caused wildfires within CSFN territories.

Wildfire Information to be Recorded

Information collected will be critical in determining the type of provincial response a potential wildfire will receive, and allow for quick and efficient allocation of resources. The information listed below is required when reporting a wildfire to the Fire Centre:

- Contact information – name, phone number or radio channel/frequency;
- The location of the fire – camp, operation, block name, road name;
- Fire rank/character – smouldering, open flame, candling, intermittent or continuous crown;
- What the fire is burning (type and species) – open or heavy timber, slash, brush, grass;
- The size of the fire (estimate);
- How quickly the fire is spreading (estimate);
- The colour of the smoke – white, grey, blue, brown, black; and
- Whether there are values or lives at risk – buildings, machinery, plantation.

Additional information should be collected when safe and practicable to do so. The following is a list of additional information that should be considered for collection when reporting a wildfire:

- Local weather conditions – temperature, precipitation, humidity, cloud cover/fog;
- Access – helicopter, road, boat – and distance/direction from wildfire;
- Adjacent fuel type (type and species) – open or heavy timber, slash, brush, grass;
- Water availability – distance and direction to nearest water source;
- Wind speed and direction (estimate);
- Slope – flat, moderate, steep;
- Slope exposure – aspect (N, E, S, W);
- Slope position – bottom, middle, top, ridge, gully;
- Whether anyone is currently fighting the wildfire or proceeding to the wildfire (contact information to relay updates and/or instruction); and
- Other products involved such as diesel, hydraulic, engine oil, gasoline, etc.

Records Management

The following records will be retained by the EPC Contractor and made available upon request:

- S100 training for all employees onsite;
- Daily fire danger class monitoring;
- Proof of pre-season fire equipment training;
- Inventory of all fire equipment (pumps, hoses, tanks, etc.); and
- Audit report of each piece of heavy equipment and pickup for associated fire tools.

9.7 Air Quality

Fugitive dust is the primary source of air emissions during TL construction. Potential dust sources include material handling/re-handling, construction and use of unpaved roads, blasting (occasional), compaction, drilling, grading, and material loading and unloading. In addition, non-dust air emission sources include exhaust from mobile and stationary equipment exhaust (multiple), and NO_x and SO_2 from blasting.

The TL AQDMP has been developed to minimize the effects of the Project's air emissions on human health and the natural environment. The TL AQDMP has adopted an air quality and emissions management system that recognizes and responds to the issue of gaseous and particulate emissions. A summary of mitigation measures included in the TL AQDMP applicable to construction are presented in Table 9.7-1.

Table 9.7-1: Air Quality Mitigation Measures

Category	Mitigation/Management Measure
Material Handling	Employees involved in material handling or management will receive training by a qualified person on the importance of minimizing material drop height (from excavator to truck, conveyor to stockpile, etc.) to reduce fugitive dust, noise and vibration.
Project roads	Speed limits will be established based on road design class, with the maximum speed limit of 50 km/h on all Project roads, unless otherwise posted.
	Reduce speed limits on Project-owned roads if weather conditions cause fugitive dust emissions and dust cannot be controlled by watering.
	Visual inspection for dust emissions from roadways in accordance with the Fugitive Dust Management Standard Operating Procedure.
	Water roads in accordance with Section 7.2 of the TL AQDMP.
	Apply dust suppressant reagents after spring melt (e.g., calcium chloride, magnesium chloride or other equivalent).
	Use coarse aggregate on roads with low silt content to reduce silt loading on roads. Re-apply aggregate when significant dust generation has been noted during visual inspections.
	Maintain equipment in good working condition according to manufacturer's recommendations.

9.8 Vegetation Management

The mitigation and management measures presented in this section are consistent with relevant measures in the following management plan(s):

- TL Integrated Vegetation Management Plan;
- TL Clearing Plan;
- TL Vegetation and Access Management Plan; and
- TL Surface Erosion Prevention and Sediment Control Plan.

General measures that will be implemented to minimize vegetation loss and disturbance during initial clearing are described in the TL Clearing Plan and TL VAMP, and in Table 9.8-1. The TL IVMP has been developed to minimize impacts on vegetation and ecosystems by limiting disturbance within the transmission line area during operation. Table 9.8-2 presents mitigation measures that will be implemented to mitigate potential effects to riparian areas.

Table 9.8-1: Vegetation Mitigation Measures

Category	Mitigation/Management Measure
Compliance	Coordinate clearing activities with other relevant management plans.
	Conduct vegetation clearing in accordance with the Wildfire Regulation.
	Limit vegetation disturbance to areas within the approved TL RoW.
	Coordinate the timing of work restrictions with CEMP Section 13.1 (Fish and Wildlife Restriction Periods). Variances may need to be applied for through FOR if activities need to happen outside of the least risk Fish and Wildlife Restriction Periods.
	Prior to commencement of construction, flag and map sensitive features identified during baseline surveys to identify no work zones around these features.
Pre-clearing	Cutting prescriptions for each site will consider best management practices in Soil Conservation Planning and Practices in the Quesnel and Vanderhoof Forest Districts (FPB 2010; specifically Appendix C Timber Harvesting Practices Extension Note #1).
	Use setbacks of at least 10 m to avoid destabilization gullies or channels as identified by the Environmental Monitor.
Clearing	Conduct vegetation clearing in accordance with the Fire Danger Class in the *Wildfire Regulation*.
	Conduct vegetation clearing in accordance with the Transmission Line Clearing Management Plan.
	Limit soil disturbance in non-cleared areas.
	Conduct clearing around sensitive environmental features in accordance with the relevant SOP (Old Growth Forest Management SOP, Rare and Plant Species at Risk Management SOP, Riparian Area Management SOP, Wetland Management SOP).
	In areas with sensitive features where clearing cannot be avoided and soil disturbance is not required (e.g., for road edges, or to create safe setbacks from forest to buildings), use low-disturbance methods and removal techniques that are most appropriate, such as pruning, mowing, girdling, topping, hand-falling, or clearing on frozen ground.
	In areas where only tree removal is required, retain shrub and herbaceous vegetation to encourage a self-sustaining, native shrub community. Limit soil disturbance, as determined by the supervising QP, through practices such as winter falling and machine work on snow, using low ground pressure machinery, and avoiding clearing during periods of high soil moisture.

Category	Mitigation/Management Measure
Clearing *(cont'd)*	Minimize disturbing areas outside or adjacent to areas targeted for clearing (e.g., minimize the creation of temporary landings, machinery and equipment movement, or extent of grubbing and stripping) as determined by the CM.
	Avoid damage to residual tree roots or stems as this can increase risk of windthrow and disease.
	Salvage and retain woody debris in accordance with the Coarse Woody Debris Management SOP.
	Maintain clearing dimensions to areas approved by the Project *Mines Act* permit, LOO, and Occupant Licence to Cut.
Post-Clearing	Minimize soil degradation and erosion by leaving stumps and understory vegetation intact where possible and adhering to the Clearing Plan, TL IVMP and TL CRP.
	Manage fugitive dust on roads in accordance with the Fugitive Dust Management SOP and the trigger action response plan provided in the TL AQDMP.
	A qualified professional will assess new edge areas adjacent to roads, work areas, and the transmission line for windthrow risk and hazard trees, and if risk levels are too high site-specific measures to reduce risk to an acceptable level will be developed. Measures will be consistent with relevant best management practices in Section 7 of the BCTS Windthrow Manual (Zielke et al. 2010), as determined by the qualified professional.
	Vegetation will be maintained in the TL RoW to a minimum height of one metre in height from the ground except at the locations of the tower bases, guy anchor wires and along the TL access roads, or where not feasible for safety or other reasons.

Notes: TL AQDMP = Transmission Line Air Quality and Fugitive Dust Management Plan; TL SEPSCP = Transmission Line Surface Erosion Prevention and Sediment Control Plan; SOP = Standard Operating Procedure; TL RoW = Transmission Line right of way

Table 9.8-2: Riparian Area Mitigation Measures

Category	Mitigation/Management Measure
Buffers	A RMA will be preserved around wetlands, watercourses, and waterbodies located within the TL RoW where there is no overlap with the infrastructure footprint (access roads, towers, guy wires, etc.), is not necessary to construct the infrastructure, or where vegetation control is not necessary (i.e., tree topping) to construct or operate the infrastructure. Work or activity within this RMA will only occur to the extent necessary for safety reasons to control invasive plants, or to install and maintain erosion or sediment runoff control measures.
Timing Windows	All instream construction at fish frequented stream crossings will consider Reduced Risk Timing Windows (July 15 to August 31) for Fish and Wildlife in Region 7 - Omineca (BC MWLAP 2004b). Any variances to complete in-stream works that are required will be pursued through FOR authorization at the direction of a Fisheries qualified professional.

Category	Mitigation/Management Measure
Timing Windows *(cont'd)*	To protect nesting birds, vegetation clearing will only be undertaken during the period of August 1 through to April 30 to avoid contravention of Section 34 of the *Wildlife Act,* unless otherwise required and by completing pre-clearing surveys under the direction of a qualified professional. See Section 3.3 in WMMP for additional information on timing windows.
Herbicides	To protect fish and wildlife, riparian areas and wildlife habitat, herbicide use in riparian areas will be avoided and a Pesticide Free Zone established in accordance with the TL IVMP or Pesticide Use Permit.
	Comply with Indigenous groups herbicide policies in their Traditional Territories which indicate chemical treatment is not an acceptable method for the purpose of invasive plant management.
Clearing Activities	Retain streamside vegetation wherever possible, including trees, shrubs, and ground cover, in accordance with the Riparian Area Management SOP.
	Remove all slash and debris that lands within the RMA to minimize the amount of disturbance to trees, shrubs or grass species, unless its removal will result in more damage than leaving it in place.
	Fall trees directionally away from stream banks and aquatic areas where feasible while maintaining safe working clearances from electrical systems.
Construction Activities	Protect natural drainages and watercourses by constructing appropriate on site sediment control devices (including but not limited to collection and diversion ditches, sediment traps, sediment ponds) in accordance with the TL SEPSCP.
	Within the RMA, preferentially use heavy equipment with low-pressure tires over tracked equipment.
Sediment and Erosion Control	The TL SEPSCP will be implemented and will identify erosion control measures (e.g., proper ditching, reducing slopes and placement of soil salvage piles, diversion and runoff collection ditches, erosion control mats).
Equipment and Fuelling	Machine inspections will occur daily when working in the RMA to determine if they are in good operating condition, clean, free of leaks, excess oil, and grease.
	No equipment refuelling or servicing (machines or hand tools) within an RMA to minimize risk of aquatic contamination in accordance with the Riparian Area Management SOP.
	Ensure all hydraulic machinery entering an RMA uses environmentally sensitive hydraulic fluids that are non-toxic to aquatic life and that are readily or inherently biodegradable.

Category	Mitigation/Management Measure
Equipment and Fuelling *(cont'd)*	Keep a spill containment kit readily accessible onsite in the event of a release of a deleterious substance to the environment. Onsite staff will be trained in emergency response and spill reporting procedures in accordance with Fuel Management and Spill Control Plan. Any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities will be immediately reported to the Provincial Emergency Program 24-hour phone line at 1-800-663-3456. See Section 9 in FMSCP for further details on the Spill Response Plan.

Notes: RMA = Riparian Management Area; TL SEPSCP = Transmission Line Surface Erosion Prevention and Sediment Control Plan; SOP = Standard Operating Procedure; TL IVMP = Transmission Line Integrated Vegetation Management Plan; WMMP = Wildlife Mitigation and Monitoring Plan.

9.8.1 Rare Plants, Plant Species, Ecosystems and Ecosystems at Risk

Four blue-listed plant species were confirmed during plant species at risk surveys to support the environmental assessment. These species occur exclusively in wetlands and are addressed in the Wetland Management and Offsetting Plan (WMOP) required by EAC Condition 24.

If new rare plants (red- or blue-listed) or plant communities are identified, or changes to the listed status of known plants and communities occur, the following mitigation measures will be implemented:

- Rare or listed plant species and plant communities will be marked or flagged, mapped, recorded, by BW Gold;
- BW Gold will salvage plant species at risk where practical, and re-establish in suitable natural habitats that are undisturbed by Project activities;
- Avoid use of herbicide sprays within 200 m of rare plants and ecosystems at risk and water, and limit herbicide use to direct application rather than broadcast sprays in accordance with the TL IVMP; and
- Reduce the impact of fugitive dust on rare plants and ecosystems at risk through adherence to established no work zones and dust control measures.

Based on the terrestrial ecosystem mapping completed for the environmental assessment and a review of the most recent BC CDC (2021) database of listed ecosystems, there are no ecosystems at risk that will be disturbed by Project activities. If an ecosystem at risk is identified, the CM will inform the BW Gold EM. The Aboriginal Monitor and Indigenous groups will also be notified of newly discovered ecosystems at risk and be engaged in the development of mitigation measures. The BW Gold EM will identify potential mitigation measures such as avoidance or buffer zones to protect these areas where practicable.

9.8.2 Invasive Plant Species

Invasive plants are non-native or alien to the ecosystem under consideration. Their introduction causes, or is likely to cause, economic or environmental damage, or harm to human health. In BC the term invasive plant is synonymous with invasive alien plant. Noxious weeds are any invasive plant species designated by regulation to be noxious under the BC *Weed Control Act* and Regulations. Mitigation measures will be implemented to prevent the establishment of invasive plants.

The TL IVMP has been developed to identify measures to prevent the introduction, establishment and spread of invasive plants (including noxious weeds) on the TL RoW during construction, operations, closure, and post-closure.

Mitigation measures that will be implemented during construction to prevent the establishment of invasive plants is presented in Table 9.8-3. Detailed measures to control and eradicate invasive plants are provided in the TL IVMP.

Table 9.8-3: Invasive Plant Mitigation Measures

Category	Mitigation/Management Measure
Prevention	The EM and CCM will perform a visual inspection for cleanliness (free of excessive dirt and debris above and beyond that reasonably expected from transport to site) on all earth moving equipment and vehicles upon arrival to the project site.
	Maintain equipment storage areas free of invasive species in accordance with the Invasive Plant Management SOP.
	Through onboarding training, ensure to inspect clothing and vehicle/equipment undercarriages for seeds and plant tissue when working in, and prior to leaving, areas known to contain invasive plants in accordance with the Invasive Plant Management SOP.
	Maintain newly disturbed sites free of invasive plants in accordance with the Invasive Plant Monitoring SOP.
	Stabilize exposed soils and consider the drainage and gradient, length of time that areas would be left exposed to evaluate the need to re-seed with native seed mix, in accordance with the TL SEPSCP.
	Restrict equipment and vehicle use to Project roads, trails and pullouts through a combination of training, mapping and signage.
Treatment	Comply with the Stellat'en First Nation, Nadleh Whut'en First Nation, and Siak'uz First Nation herbicide policies in their Traditional Territories.
	Use spot applications and avoid broad spraying of herbicides, especially adjacent to listed plant communities or plants and riparian zones in accordance with the Invasive Plant Management SOP.
Cleaning Equipment	After working in areas with known infestations, clean vehicles and equipment at the infested site or in an area where contamination and seed spread is unlikely, such as a mud-free, gravel, concrete, or other hard surface. If this is not possible, a regularly maintained area will be used for cleaning, such as the truck washing bay.
	If working in and around water, wader boots and waders should be disinfected 1) before starting work in a new watershed, and 2) between different wetlands.
	Equipment cleaning will be located outside any Riparian Management Area in accordance with the Riparian Area Management SOP. After cleaning, operators will inspect vehicle and equipment to ensure excess mud, soil, vegetation and debris is removed and left at the site of infestation.
	If vehicles or earth moving equipment are causing the spread of invasive plants, subject to the direction of a qualified person, a quarantine area may be established which may include blocking off the infestation, implementing treatment and control measures, and using portable wash stations.

Notes: CM = Construction Manager; CCM = Contractor Construction Manager; SOP = Standard Operating Procedure; TL SEPSCP = Transmission Line Surface Erosion Prevention and Sediment Control Plan

9.9 Wetlands

Potential effects to wetlands due to construction include loss of wetland extent/function resulting from site clearing, grubbing, and altered hydrological processes resulting in water table drawdown, and diversion of surface and seepage water. Potential causes of wetland degradation relevant to the discrete activity of construction include fugitive dust deposition, water quality degradation, noise pollution, and potentially light pollution.

In accordance with EAC Condition 24, BW Gold has developed the WMOP that includes, among other items, the methods by which wetland conditions will be documented and monitored as well as the wetland offsetting plan for impacted wetlands. Table 9.9-1 presents mitigation measures that BW Gold will implement to mitigate potential effects to wetlands during TL construction in accordance with the Wetland Management and Offsetting Plan.

Table 9.9-1: Wetland Mitigation Measures

Category	Mitigation Measure
Wetland Function	Maintain drainage pathways and wetland hydrology by installing appropriately sized culverts for stream and wetland crossings in accordance with the respective engineering design report.
	Locate fuel storage and refuelling activities outside any wetland RMA (min. 30 to 50 m depending on wetland size), in accordance with the Wetland Management SOP.
	Place temporary soil salvage stockpiles in locations where they will maintain natural drainages.
	Do not apply fertilizer within the Riparian Management Area of an aquatic resource and before precipitation events to limit chemical runoff from entering wetlands.
	Replant native vegetation to expedite succession in accordance with the TL SEPSCP.
	Use low ground pressure equipment or tracked equipment for work in areas with saturated soils.
	Use timber mats, driving mats, or log corduroys or other means of ground protection where necessary (e.g., to prevent vegetation disturbance, saturated conditions, etc.) to minimize disturbances to vegetation and reduce rutting.
	Minimize the width of roads and trails consistent with maintaining safety and road design considerations.
	Design approaches to wetlands so that the surface runoff carrying potential sediment is diverted before entering the wetland.
	Manage unauthorized use of roads during and after construction and operations to minimize impacts to wetlands.
	Maintain road running surfaces, ditches and cross drains to minimize erosion and sediment delivery.
	Temporary and permanent road construction will follow guidance outlined for the appropriate soil conditions.

Category	Mitigation Measure
Wetland Function *(cont'd)*	Activities and works in and around wetlands will be designed and planned to minimize loss or disturbance of wetlands.
	Approaches to wetlands will be designed and constructed such that they are perpendicular to the margin of the wetland to minimize loss or disturbance of wetland vegetation.
	Plan and implement activities occurring near adjacent wetlands as determined by the TL SEPSCP to ensure deleterious substances (e.g., sediment, solvent, fuel, etc.) do not enter the wetland by installing sediment and erosion control mitigation measures such as, but not limited to silt fencing, hay bales, multi-barrier approaches, at the direction of the environmental monitor and supported by the QP (TL SEPSCP).
	Clearing of wetland vegetation will be minimized to the extent practical. Pruning or topping of vegetation will be utilized instead of grubbing.
	Machinery will be washed, refueled and serviced in accordance with the Riparian Area Management SOP as to prevent any deleterious substances from entering the wetland.
Wetland Extent	Establish 30 metre of undisturbed vegetation buffer zone around wetlands located outside the Project footprint, as long as interference with infrastructure is not expected.
	Flag or otherwise identify clearing limits in accordance with the WMOP and Wetland Management SOP.

Notes: SOP = Standard Operating Procedure; TL SEPSCP = Transmission Line Surface Erosion Prevention and Sediment Control Plan

9.10 Wildlife Protection

The mitigation and management measures presented in this section are consistent with the following management plan(s):

- Wildlife Mitigation and Monitoring Plan;
- TL Integrated Vegetation Management Plan;
- TL Vegetation and Access Management Plan;
- TL Air Quality and Fugitive Dust Management Plan; and
- TL Noise and Vibration Effects Monitoring and Mitigation Plan.

Project infrastructure has been designed to avoid and minimize potential effects on wildlife and wildlife habitat, including sensory disturbance (e.g., noise and light). Mitigation measures involving design are discussed in the WMMP (ERM 2021a) and not discussed further.

Potential effects to wildlife and wildlife habitat during construction and operation of the TL are discussed in the WMMP and include alteration and loss of habitat, changes to wildlife movement, indirect and direct mortality, introduction of potential attractants, and changes to health. Table 9.10-1 identifies mitigation measures that will be implemented to mitigate TL construction-related impacts to wildlife and wildlife habitat.

Table 9.10-1: Wildlife Mitigation Measures

Category	Mitigation/Management Measure
General Wildlife Mitigation Measures and Best Management Practices	
Stellako Wildlife Management Area	Work with FOR and Stellat'en First Nation to address potential access management issues related to the Stellako Wildlife Management Area.
Research Project on EMF fields	BW Gold will work with Nadleh and Stellat'en First Nations to develop a research and monitoring program to study the potential effects of EMF [electromagnetic fields] on birds along the TL. Existing information on the effects of EMF on birds from other transmission lines will be used to inform initial mitigation strategies.
Habitat Loss and Alteration	The EM in consultation with a qualified professional will implement the following measures in accordance with WMMP, Section 3.3.2 to minimize overall clearing and ground disturbance during construction: • Flag sensitive habitats adjacent to the construction footprint; • To retain the topsoil and vegetation root mat, grubbing, stripping, or removal of shrubs and herbaceous species will not be completed unless it is required for operations; • Progressively reclaim roads and infrastructure in accordance with the TL VAMP when no longer required; • Use existing roads and cleared / disturbed areas rather than disturbing new areas; and • Retain coarse woody debris in accordance with the Coarse Woody Debris Management SOP (Locations of coarse woody debris piles/retention will be directed by a site supervisor on a site-specific basis).
	Riparian Area Management SOP will be implemented by the EPC Contractor. The Riparian Area Management SOP identifies the safe and efficient work practices to manage and protect riparian areas adjacent to wildlife habitats.
	During clearing of the forest, the EPC Contractor will implement mitigations for edge effects in accordance with WMMP, Section 3.3.2.
	Mitigation measures identified in the Clearing Plan will be implemented by the EPC Contractor during activities to minimize the overall clearing and ground disturbance.
Transportation and Access	The Contractor Supervisor will implement the following access road use and haulage operating protocols: • Radio positions along the FSR; • No speeding on the FSR; and • Report significant wildlife sightings, and all incidents or accidents on the FSR to the EM using the Wildlife Incident Report Form (Appendix G). Additional details are included in the Journey Management Package given to all Personnel.

Category	Mitigation/Management Measure
Transportation and Access *(cont'd)*	Other commercial users of Kluskus FSR will be notified regarding relevant wildlife safety provisions along roadways through signage and participation in the industrial road users group, with relevant measures incorporated into road use agreements.
	BW Gold will participate in the Kluskus FSR industrial road users group and safety groups throughout the Construction phase.
Wildlife Activity on Roadways	All mine vehicles and mobile equipment, including authorized private vehicles, will be equipped with or escorted by vehicles with two-way radios when travelling along Project-controlled roads.
	Wildlife logs will be maintained by the EM at the mine site to include significant recorded wildlife sightings, and all interactions, and incidents (and reported annually in the WMMP report). The EM will inform all staff/contractors of any locations of high animal activity on access roads and the appropriate actions to be taken (ex. signage erected). The EM, in consultation with a qualified professional, will determine appropriate actions depending on the circumstance and maintain overall responsibility for implementation of the recommendations.
	Wildlife will be given the right of way along all Project-controlled roads, and site orientation will include measures for avoidance of vehicle/wildlife encounters.
	Wildlife crossing signs will be posted where identified wildlife corridors intersect project roads, as identified through pre-construction surveys. This includes identification of amphibian crossings, such as near potential western toad breeding sites: • Wildlife crossings were surveyed during pre-construction habitat surveys conducted during summer of 2021; no wildlife crossings were identified on Project roads or FSRs associated with TL-related activity; • Two crossings have been identified on the Kluskus and Kluskus-Ootsa FSRs, BW Gold will notify FOR and offer to install wildlife crossing signs prior to initiating construction activities; • Signage will be maintained and adaptively managed through all phases of the Project; • Signs will be posted along Project access roads to identify caribou sensitive areas, including migration routes and seasonal feeding areas; and • Cameras may be used to document trails where wildlife cross the road, or at locations where breaks have been plowed to allow crossing by moose.
	Wildlife incidents or mortalities will be addressed with adaptive management measures indicated in Section 1.4 of the WMMP, including potential adaptive management measures.
	If amphibian mortality on roadways is identified, adaptive management measures will be implemented in accordance with the WMMP such as additional consideration for amphibian passage (e.g., tunnel and fence systems or limitations on timing of traffic movement in that area).

Category	Mitigation/Management Measure
Road Condition Management	Speed limits on all Project roads are set at 50 km/h. Speed limits are clearly marked through signage.
	Revegetate roadsides with native species that avoid attraction of wildlife (e.g., no clover or other highly palatable species), in accordance with the TL RCP to reduce wildlife incidents. Species selection will be implemented by the EM in consultation with a qualified professional.
	Road salts will not be used for de-icing, unless as determined by the CM (in consultation with a qualified professional), other methods for de-icing and traction control do not meet safety requirements.
	All staff (including contractors) will be required to report carrion observed on roads. Once reported, carrion will be removed from roads promptly. Carrion management methods will be established in consultation with relevant authorities, and Aboriginal Groups. The EAC specifies relocating carrion to nearby areas to serve as a food source for wildlife, unless FOR is not able to authorize removal and relocation. BW Gold will work with local Indigenous nations and offer ungulates to local Aboriginal trapline (Keyoh) holders. FOR will be notified via email within 72 hours of carrion resulting from mine activities.
	The CM will implement the management of snow bank heights using blading or other clearing techniques, and maintenance of escape pathways at wildlife corridors along roadways to keep banks and pathways within heights that won't impeded wildlife movement.
Amphibians (WMMP Section 4.1)	Avoidance of amphibian breeding ponds will include no-work buffers surrounding known breeding ponds and taking into account BC *Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia* (MOE 2014b), which recommends a 30-150 m buffer zone. The no-work buffer will be flagged in consultation a qualified professional. EPC Contractor Physical barriers (e.g., drift fencing) may also be used as mitigation when working near wetlands, to prevent amphibians from entering work areas.
	• If avoidance of breeding ponds is not possible and salvage is required, it will be conducted following *Best Management Practices for Amphibian and Reptile Salvages in British Columbia* (MFLNRO 2016) and in consultation with a qualified professional as follows (in accordance with DS Condition 8.11): • Obtain a salvage permit under the *Wildlife Act*; • Conduct a baseline inventory and assessment, including a comprehensive risk assessment; • Consider habitat type when determining capture techniques, inventory and salvage timing, and capture effort; • Conduct salvage during the time of year when the least number of species and life stages will be affected; and • Where possible, create a compensation site (e.g., construct or restore a wetland) instead of using naturally occurring habitat for release.

Category	Mitigation/Management Measure
Amphibians (WMMP Section 4.1; *cont'd*)	Under the supervision of a qualified professional, amphibians will be salvaged from on-site breeding ponds prior to clearing activities that cannot be scheduled outside of sensitive periods in accordance with DS Condition 8.11. Prior to an amphibian salvage, an Amphibian Salvage SOP will be produced by a qualified professional.
	All staff will follow vehicle and equipment cleaning procedures, after working in areas with known invasive plants in accordance with TL IVMP Section 8.2.1.
Bats (WMMP Section 4.2)	Clearing work will be planned for outside of the sensitive period for bats (see Table 13.1-1) where possible.
	If clearing must occur during the sensitive period for bats (see Table 13.1-1), then the inventory of potential hibernacula and roost features identified during pre-construction surveys will be reviewed by a qualified professional prior to disturbance to determine whether bats are using the area and provide direction to the CM.
	Buffer zones will be established by a qualified professional around active hibernacula and active roosts, in consultation with Aboriginal Groups and relevant authorities, and considering recommendations in the *Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area* (BC FLNRO 2014).
	Site-specific buffer distances will be recommended by a qualified professional to the CM to be implemented during clearing. The buffer distances will depend on the species present and intensity level of activity (BC MFLNRO 2014; Holroyd and Craig 2016).
Caribou	Refer to the Caribou Mitigation and Monitoring Plan.
Moose (WMMP Section 4.4)	Construction activities should avoid moose habitat, such as salt licks and wetlands, where possible.
	To limit disruption to moose during construction, mitigation measures will be implemented in accordance with the NVMP (as determined by a qualified professional) including: • Use noise abatement; and • Work will pause if a moose is seen from the construction area, and resume once the animal(s) have left the area.
Furbearers (WMMP Section 4.5)	Construction activities should avoid sensitive wildlife seasons for American marten, fisher, and wolverine (13.1-1). Construction activities will be planned outside of this period unless not technically feasible, as determined by the Mine Manager.
	If activity is being proposed during sensitive time periods for furbearers (13.1-1), no work buffer zones for potential or known furbearer dens will be established by a qualified professional and implemented by the EM. The buffer zones will take into account FLNRO (2014) and dens identified during pre-construction surveys; recommended buffer zones vary according to species and activity. Mitigations will be completed as required by DS Condition 8.10. • If a no work buffer zone is established, Table 1 minimum buffer zones of 50 m indicated in EAC Condition 23c will be used surrounding identified dens.

Category	Mitigation/Management Measure
Furbearers (WMMP Section 4.5; *cont'd*)	• If a buffer zone is not possible a qualified professional will determine mitigation measures based on site-specific characteristics including the size of the feature, the species involved, and the intensity level of planned activities. This may include rescheduling of work. Mitigation measures will also be in accordance to EAC Condition 23c: "Should the survey or assessment determine that there is furbearer denning habitat within the Project Area, the plan must identify mitigation measures to be applied during the denning period, as determined by a Qualified Professional, if avoidance is not possible, consideration of BC Environmental Mitigation Policy, including Procedures for Mitigating Impacts on Environmental Values (BC EMP)."
Grizzly Bear (WMMP Section 4.6)	Construction activities should avoid sensitive wildlife seasons for grizzly bear as defined in the *Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area* (MFLNRO 2014). The sensitive wildlife seasons for grizzly bear is provided in Table 13.1-1.
	• A minimum buffer distance of 60 m will be established if an active grizzly bear den is identified during Project construction. Buffers will be determined by a qualified professional and will be based on site-specific characteristics including the intensity level of planned activities, and may exceed 60 m in some circumstances. • If activities must occur within the buffer zone of a potential den, additional assessment may be conducted to determine occupancy, in consultation with a qualified professional, FOR Indigenous nations and Aboriginal Groups.
	Waste management practices will be implemented by the EM to reduce attractiveness to bears, including measures for food preparation and storage, and waste storage and disposal.
Birds (WMMP Section 4.7)	Avoid vegetation clearing during the breeding season for birds in accordance with Table 13.1-1, unless otherwise authorized. If vegetation clearing must occur during the breeding season, a qualified professional will conduct pre-clearing surveys, and determine no-work setbacks around any nests.
	Wildlife trees will be retained as snags if they pose little to no risk to human safety.

Notes: FOR = Ministry of Forests; CM = Construction Manager; EPC = Engineering, Procurement, and Construction; EM = Environmental Manager; SOP = Standard Operating Procedure; TL IVMP = Transmission Line Integrated Vegetation Management Plan; WMMP = Wildlife Mitigation and Monitoring Plan.

9.10.1 Pathogens

Preventive protocols have been developed to protect wildlife against introduced pathogens or invasive species. These protocols primarily apply to cleaning and transport of equipment between sites, which applies for any pre-clearing and construction work in aquatic habitats (for amphibians) and forested habitats (for bats) and disturbed habitats, such as roadsides (for invasive plants). Survey and monitoring protocol references are included, and may be required if handling wildlife or in-water work is required.

Any signs of sick/infected animals or invasive species will be reported to supervisory personnel and regulators will be promptly notified. Reporting procedures for wildlife sighting and signs will be covered in the Site Orientation and training.

Chytridiomycosis is an infectious disease in amphibians transmitted by the aquatic-spreading chytrid fungus. Prevention protocols require cleaning and possibly disinfecting equipment brought to the site that might work in wetland areas, including construction and clearing equipment as follows (Protocols are included in Appendix C):

- Clean construction and excavation equipment working in wetlands between sites. Any areas with suspected or known occurrence of chytrid must follow decontamination protocols or have site-specific gear; and
- General cleaning protocols for field work around wetlands (i.e., amphibian surveys, salvage, wetlands surveying) as detailed : *Standard Operating Procedures: Hygiene Protocols for Aquatic Field Research*.

Bat populations are threatened by white nose syndrome, a deadly and rapidly spreading disease caused by a fungus (*Pseudogymnoascus destructans*). Prevention protocols, including reporting and cleaning procedures are provided in Appendix D: Western Canada White Nose Syndrome Transmission Prevention.

9.10.2 Nest Chance Find Procedures

Any chance finds of nests would be immediately reported to the Environmental Manager (training for reporting procedures provided to all on site employees and contractors, as described in Section 2.1 of the WMMP). Work in the area will be paused until the EM can assess the area. Mitigation depends on the occupancy status of the nest and the species:

- If the nest is occupied (i.e., by a bird, eggs, or chicks) a QP will be contacted to determine the appropriate setback buffer based on the species and type of work being conducted in the area.
- Empty or old raptor nests will be removed with appropriate permits and in consultation with the provincial government.
- Empty or old nests of migratory birds including upland birds, shorebirds, and waterbirds which are not listed on Schedule 1 of the updated Migratory Bird Convention Act will be removed and work will proceed as planned (after July 31, 2022). Empty or old nests of migratory birds listed on Schedule 1 of the updated MBCA (e.g., pileated woodpecker) will be appropriately buffered and monitored for activity for the duration of time listed in Schedule 1; a permit for destruction/removal will be applied for if conditions listed in Schedule 1 are met.

9.11 Aquatic Resource Management

Construction activities such as clearing, excavation and soil handling in close proximity to watercourses have the potential to impact fish and fish habitat, aquatic habitat and riparian areas. Potential effects include alteration of aquatic habitat and reduction of fish health and survival. Table 9.11-1 identifies measures to mitigate effects on fish and fish habitat during TL construction activities.

Table 9.11-1: Aquatic Resources Management

Category	Mitigation/Management Measure
Reduced Risk Timing Windows	If fish frequented in-stream construction works and activities are scheduled outside of reduced risk timing windows (Omineca Region is July 15 to April 15 [rainbow trout]), a qualified professional will be engaged to determine specific mitigation measures to be implemented in accordance with provincial and federal requirements for working outside of timing windows.
Clearing	If clearing activities including the final clearing footprint (e.g., machinery and equipment movement, or clearing and grubbing) are planned to occur adjacent to or within riparian areas, the Riparian Area Management SOP will be implemented by the Construction Supervisor. The Riparian Area Management SOP identifies the safe and efficient work practices to manage and protect riparian areas.
	During all clearing activities, the TL SEPSCP will be implemented by the EPC Contractor and other contractors that report to the CM. The TL SEPSCP identifies erosion control measures to prevent exposed soils from being entrained by water or wind, sediment controls to prevent sediment mobilizing into natural waterbodies impacting fish and aquatic life and the removal of sediment suspended in water once erosion has occurred. This includes proper ditching, installation of silt fencing and reducing slopes and placement of soil salvage piles, diversion and runoff collection ditches, sediment control ponds, erosion control mats and use of flocculants.
Angling	No angling is permitted by employees or contractors while they are on the mine site or TL RoW, or while travelling to/from the Project.
Aquatic Resources	The EPC Contractor and other contractors that report to the CM will ensure that DFO's Measures to Protect Fish and Fish Habitat (DFO 2019) as determined by a qualified professional are implemented. Measures may include: • Prevent the death of fish by avoiding use of explosives in or near water, planning in water work, undertaking or activity to respect timing windows to protect fish, including: their eggs, juveniles, spawning adults, and the organisms upon which they feed and migrate. • Maintain riparian vegetation by: – maintaining an undisturbed vegetated buffer zone between areas of on-land activity and the high water mark of any water body; – using existing trails, roads or cut lines wherever possible; – avoiding tree removal; and – using methods to prevent soil compaction, such as swamp mats or pads. • Prevent the harmful alteration, disruption or destruction of fish habitat by avoiding: – conducting any work, undertaking or activity in water; – placing fill or other temporary or permanent structures below the high water mark; – fording of the watercourse; – disturbing or removing materials from the banks, shoreline or waterbody bed, such as: ▪ sand, ▪ rocks, ▪ aquatic vegetation, and ▪ natural wood debris;

Category	Mitigation/Management Measure
	– building structures in areas that: ▪ may result in erosion and/or scouring of the stream bed or banks, ▪ are inherently unstable, like: - bends, - meanders, - floodplains, - alluvial fans, and - braided streams. • Maintain fish passage by avoiding changing flow or water level or obstructing or interfering with the movement and migration of fish; and • Implement the SEPSCP.
	Approved Work Practices for Managing Riparian Vegetation (BC Hydro et al. 2003) will be implemented by EPC Contractor and other contractors that report to the CM. The main methods for managing riparian vegetation include pruning, slashing, mowing, topping, girdling, hinging and hazard/danger tree removal. The EM in consultation with a qualified professional will determine the appropriate prescriptions for the construction activity.
	• The Riparian Area Management SOP will be implemented by the Construction Supervisor that will identify the safe and efficient work practices to manage and protect riparian areas. • Adhere to mitigation measures identified on Environmental Alignment Sheets.
	• To prevent entry of contaminant materials in water: • Implement TL spill response plan immediately in the event of a spill of contaminant materials; • Maintain spill response kits on site with the appropriate type and volume of material specific for each piece of equipment that handles or transports contaminant materials (including fuel), including: • Pickup trucks; • Dump trucks; • Commercial transport trucks; • Excavation equipment; • Fuel trucks.; and • Secondary containment berms • Stop work and contain contaminant materials to prevent dispersal; • Report any spills of sewage, oil, fuel or other contaminant materials whether near or directly into a water body; • Ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse; • Clean up and appropriately dispose of the contaminant materials; • Plan activities near water such that materials don’t enter the watercourse; • Maintain all machinery on site in a clean condition and free of fluid leaks to prevent any contaminant materials from entering the water; • Wash down tools and equipment at designated wash facilities, refuel and service machinery and store fuel and other materials for the machinery in outside of the RMA and areas with significant downslope (>35%) to a watercourse to prevent any contaminant materials from entering the water;

Category	Mitigation/Management Measure
	• Provide containment facilities for wash-down water and appropriate disposal of material; and • Dispose all waste materials above the high water mark of nearby waterbodies to prevent entry.
Fish-bearing streams	All fish bearing streams will be crossed by free span bridge or fish passage corrugated metal pipe.
Fording of Non-fish bearing streams	At this time no fish frequented streams will be crossed by fording. If that changes, fording of a non-fish bearing stream for the purpose of moving equipment (i.e., one-time crossing only, over and back) will be authorized by the EM in consultation with a qualified professional. Fording of streams will only be completed if the channel width at the crossing is no greater than 5 m from the ordinary high water mark to ordinary high water mark (as per DFO Interim Code of Practice: Temporary Stream Crossings (DFO 2020).

Notes: FOR = Ministry of Forests; CM = Construction Manager; EPC = Engineering, Procurement, and Construction; EM = Environmental Manager; SOP = Standard Operating Procedure; TL SEPSCP = Transmission Line Surface Erosion Prevention and Sediment Control Plan; DFO = Fisheries and Oceans Canada.

9.12 Non-traditional Land Use

Construction activities may interfere with the use and access to Crown and third-party tenures held by other parties or public access. Table 9.12-1 identifies measures that will be implemented to mitigate potential effects with respect to non-traditional land use during construction of the TL on the mine site and off site infrastructure. The Transmission Line Agriculture and Range Management Plan (TL ARMP) has been developed to manage the safety, watering and (pasture) resource accessibility for range and tenure holders as well as interaction between livestock, vehicles, and the TL RoW. The plan describes:

- Learnings from consultation with tenure holders on watering locations, and how alternative watering locations will be identified if livestock access to water supply is curtailed by TL construction;
- Identification of groundwater wells used by tenure holders and protection methods;
- Processes to identify methods, timing and locations to facilitate movement of livestock and farm machinery across RoW corridors, where applicable;
- Notification of livestock owners of the construction schedule and activities to allow livestock to be moved to other pastures if necessary; and
- Processes to install fencing to restrict cattle movement into the TL RoW at specific locations.

Table 9.12-1: Non-traditional Land Use Mitigation Measures

Category	Mitigation/Management Measure
Livestock and Agriculture	If livestock access to water supply is curtailed with construction of transmission line infrastructure or habitat offsetting (e.g., cattle exclusion fencing from fish habitat offsetting): • The EM will Identify alternative watering locations in discussion with the land and/or livestock owner(s).

Category	Mitigation/Management Measure
Livestock and Agriculture *(cont'd)*	Cattle movement into the TL RoW (Land File 0194075) and fisheries habitat offsetting works will be restricted with: • The installation of temporary/permanent fencing along active pastures, in consultation with the relevant landowner.
	Where required, install fencing to restrict cattle movement on to TL RoW, and ensure that movement of livestock and farm machinery is supported via communication between agriculture/range users and Project staff.
	To minimize compaction of soil: • Project vehicles will be restricted to use the RoWs and designated access roads near Project development areas through training and signage.
	To minimize the introduction and spread of invasive plants: • The EM will implement the general mitigation measures, vehicle and equipment cleaning protocols, in accordance with the Invasive Plant Management Plan. • The Departmental Manager will implement the Invasive Plant Management SOP relevant to their area.
	Provide construction schedule and list of activities (including closure windows) 30 days prior to construction to potentially affected agriculture and range stakeholders to facilitate livestock management and allow livestock to be moved to other grazing opportunities if necessary and/or when applicable.
Groundwater	Protect groundwater wells during construction activities with temporary fencing within 2 m of the well.
Timber	To minimize the potential escape of beetles from infested logs during clearing, handling, and hauling of beetle infested wood the Site Supervisor will implement the following mitigations as guided by a qualified professional and in accordance with guidance provided by FOR: • Determine if woody debris stored on site have bark beetles and if noted, adopt measures to control infestation and spread (determined by a qualified professional). • Assess windthrow to determine if bark beetles require salvage of downed trees. • Prior to hauling beetle infested wood, determine the high beetle flight period and reduce transport windows accordingly.
	The Community Forest, an area-based tenure, will have access to any merchantable timber removed in the Fraser Lake community forest.
Access	Public access to recreational and snowmobiling trails that are affected by construction activities will be managed by: • Adjustment of construction activity schedule; or • Erect appropriate signage (as determined in consultation with FOR) on affected recreational and snowmobiling trails, if adjusting scheduling is not possible.

Category	Mitigation/Management Measure
Access *(cont'd)*	If temporary closures on affected access routes, including water access (e.g., put-in places and points) are required the EM will: • Implement temporary access restrictions in accordance with the MSTCP where necessary to protect human health; and • Erect appropriate signage to provide notice of temporary closures.
Noise	To limit disruption to sensitive receptors (hunting, guide outfitting and trapping) mitigation measures will be implemented in accordance with the TL NVMP (as determined by a qualified professional) including: • Use noise abatement; • Schedule construction activities at noise sensitive locations and times; and • Avoid low altitude flights except on final approach and take-off.
Schedule	Provide the construction schedule to tenure holders and recreational groups (e.g., Northwest Brigade Paddling Club, nearby lodges and the local offices of BC FOR) overlapping the Project (or any other Stakeholder who requests them), 30 days prior to the start of construction and resolve any issues related to access as per appropriate industry and provincial standards, guidelines and best practices.
	Provide maps and early notification of Project development and other physical work to affected regional forestry stakeholders
	Notify the Stellat'en First Nation of Construction and Post-closure schedules and consult with Stellat'en First Nation to identify and address any concerns regarding access to the tenure, including placement of TL towers.

Notes: FOR = Ministry of Forests; TL RoW = Transmission Line right of way; MSTCP = Mine Site Traffic Control Plan; NVMP = Noise and Vibration Effects Monitoring and Mitigation Plan; SOP = Standard Operating Procedure.

9.13 Archaeological and Cultural Heritage Resources

The TL ACHRMP has been developed to provide direction and guidance regarding the protection and management of tangible cultural heritage resources located within the transmission line construction area. Tangible cultural heritage includes archaeological sites and other cultural heritage resources (CHRs) such as historic, traditional use, and paleontological sites. The scope of the plan includes an object, site or location of a traditional societal practice that is of historical, cultural, or archaeological significance to BC, a community, or an Aboriginal people. The Plan includes procedures for inadvertent discovery or chance finds and applies to the TL's construction, operation, closure, and post-closure phases.

The objectives of the TL ACHRMP are to:

- Minimize adverse effects to known and as-yet unknown tangible archaeological sites and CHRs;
- Identify applicable legislation, regulations, and guidelines, as well as permit obligations;
- Define training requirements pertaining to archaeological and CHR awareness and monitoring; and
- Provide a Chance Find Procedure.

Table 9.13-1 identifies measures that will be implemented to mitigate potential effects with respect to known and unknown archaeological and CHRs during construction of the TL. As new resources may be discovered during the course of construction, a Chance Find Procedure has been developed and is

included as Appendix E. Detailed constraint maps will be developed by the Project Archaeologist at a large scale, suitable for field use that will summarize the archaeological constraints and mitigations to be implemented along the proposed RoW corridor. These maps along with relevant management plans will be updated to include the most recent data and recommendations from the 2021 Archaeological Impact Assessment (AIA) of the TL corridor conducted during the late summer and fall of 2021 (reports currently in progress). Further AIA work is planned for specific segments of the proposed RoW corridor for Q2 2022. Work disturbance will not proceed along these segments of the proposed RoW until such time as the areas in question are assessed and recommendations for mitigation are provided by the Project Archaeologist and found to be acceptable by government and relevant Indigenous nations. In the meantime, these areas will be denoted as no-disturbance areas on constraint maps developed by the Project Archaeologist. Constraint maps will be provided to the EPC Contractor for integration into IFC plans and the Construction Execution Plan for the TL.

Table 9.13-1: Archaeological, Heritage, and Spiritual Resource Mitigation Measures

Category	Mitigation/Management Measure
Known Archaeological Sites	• The following measures will be taken for known sites located within 50 m of the Transmission Line Permitted Construction Zone: • All identified sites within 50 m of the Transmission Line Construction Zone will be identified as Management Zones. • Within the Transmission Line Permitted Construction Zone Management Zones will be identified on Project Maps and the Special Management Areas will be flagged in the field. • “Management Zone” is a 50 m buffer from a site. A monitor may be required. • “Special Management Zone” is a flagged 10 m buffer around the site boundary. Ground disturbance will be avoided. Prescriptions for work inside the 10 m buffer are dependent upon each site recommendation for management and may include hand falling or limited machine access. A monitor will be required. • Protected Archaeological Sites (Sites): Are inside the Special Management Zone and are flagged with “No Work Zone”. Protected sites will follow the procedures below. • Procedures to record, analyse and mitigate effects on a site will be determined in consultation with the BC Archaeology Branch and affected Indigenous nations as per the *Heritage Conservation Act* permit and carried out by an archaeologist under a *Heritage Conservation Act* (Section 12.2 heritage investigation and/or Section 12.4 site alteration permits). Mitigation measures will be dependent on the specifics of the archaeological site and the levels of impact. Mitigations generally involve detailed mapping, photography, and systematic data recovery through surface collection and controlled excavations of evaluative units if subsurface deposits are present. • If the site is subsurface and the impacts will be limited to tree removal then the following activities may occur with a monitor present: – Hand falling – Reaching in – Cherry picking – Stubbing all trees to 1 m Sites that are identified by Indigenous nations as confidential will be depicted as polygons. • Annual monitoring of the site. • Construction monitoring during work within the Special Management Zone.

Category	Mitigation/Management Measure
Known Archaeological Sites *(cont'd)*	• Any artifacts collected during archaeological assessment will be sent to the Exploration Place Museum and Science Centre in Prince George, BC or another approved repository identified in the relevant Section 12.2 or 12.4 permit under the *Heritage Conservation Act*. The following measures will be completed when Project activities are located between 50 and 150 m of a known site, where the site is located outside of the Transmission Line Permitted Construction Zone: • A Management Zone of 50 m will be created as a polygon on project maps; • Should impacts to the Management Zone be observed the Project Archaeologist and the Archaeology Branch will be contacted to determine if additional mitigation measures are required to protect the site; and • Should impacts to ground surface be observed within the "Management Zone" at heritage sites, the EM will contact Indigenous Knowledge Holder(s) to determine if additional mitigation measures are required to protect the site.
Known Historic, and Paleontological Sites	There are known palaeontological sites within 150 m of the proposed transmission line routes (TL ACHRMP Section 7.4). A preliminary Fossil Impact Assessment has been conducted prior to construction. If paleontological materials are recovered, the BC Fossil Management Office will be consulted to determine the need for an appropriate repository.
Known Cultural and Spiritual Sites	• No known cultural or spiritual sites will be affected by the TL. • Additional consultation with Indigenous groups specifically relating to the location and identification of cultural and spiritual resources within the Project footprint will be conducted prior to any further disturbance. • If potential impacts are identified the cultural importance and spiritual properties of these resources will be acknowledged through ceremony or appropriate cultural protocols and preserved to the extent possible. Should impacts be anticipated, or found within 50 m of a site, Indigenous groups and the Project Archaeologist will be contacted immediately to determine if additional mitigation measures are required prior further work in the area. The BW Gold EM will be engaged on the proposed mitigation measures. Sites that are identified by Indigenous groups as confidential will be depicted as polygons, including an area of at least 50 m around the site, on Project maps and marked as a "No Work Zones" around the site but will not be delineated on the ground.
Culturally Modified Tree Sites (CMTs)	• Prior to implementation of the mitigations, CMTs will be buffered by 50m and shown on maps as a Management Zone. The management strategy will be determined in discussion between BW Gold and Indigenous Nations (TL ACHRMP 8.3). • Prior to alteration to post-1846 CMTs the relevant/affected Indigenous communities will be consulted to determine possible preferred mitigation measures. • Common mitigation measures for post-1846 CMTs with cultural significance include: detailed measurements and photography, removing and preserving the modified portion of the tree, or removing a cross-section (cookie) of the modified portion of the tree.

Category	Mitigation/Management Measure
Trails	The Messue and Cheslatta Trails are crossed by the TL RoW. These locations are flagged in the field. Existing previously disturbed trail sections will be utilized to cross the trail site areas. A 5 m buffer of avoidance will be implemented where no ground disturbing activities may occur. If a trail is encountered during construction: • The relevant/affected Indigenous communities will be consulted to determine possible preferred mitigation measures prior to the alteration of a trail; and • Possible mitigation measures for recording trails include photography and detailed mapping of the route and surrounding features.
Paleontological Sites	If paleontological sites are encountered: • A Paleontological Chance Find Procedure will be followed. • Work will be stopped pending consultation with the Fossil Management Office to determine an appropriate repository; and • The Project Archeologist will flag or delineate the site by an area of at least 30 m around the site and marked as a “No Work Zone” from the site boundary.
Chance Finds	The Project Archaeologist will implement the Archaeological and Cultural Heritage Chance Find Procedure (Appendix E) if there is a suspected discovery of archaeological, heritage, cultural, or spiritual resources. The project EM will implement that Paleontological Chance Find Procedure (Appendix H) if paleontological resources are found.

9.14 Soil Management

Earthworks are required to construct access roads and tower bases. Suitable soils will be salvaged and stockpiled for reclamation. Measures to mitigate potential effects on soils are presented in Table 9.14-1. Additional information can be found in the TL SEPSCP.

Table 9.14-1: Soil Mitigation Measures

Category	Mitigation/Management Measure
Soil Handling	Avoid salvage during dry (less than 0.25 mm/day of precipitation in the previous week) and/or windy (consistently greater than 30 km/h) conditions to prevent loss of fine-textured material and dust deposition on adjacent areas. If it is necessary to conduct salvage under these conditions, field-fit mitigation measures will be implemented to minimize erosion and dust generation (e.g., water application) as determined by a qualified professional.
	Soil salvage may occur under frozen conditions with the benefit of reducing soil compaction, but snow should be removed prior to salvaging to reduce undesired settling or erosion in stockpiles or reclamation areas. Avoid salvage where frost penetrates greater than 75% of the target soil profile, making it challenging to accurately segregate soils causing admixing.

Category	Mitigation/Management Measure
	Where the water table is within 50 cm of the surface (e.g., wetlands), drain areas targeted for soil salvage prior to salvage and manage salvage operations in accordance with the TL SEPSCP.
Soil Stockpiles	Stockpile (or windrow) soils in accordance with the TL SEPSCP to prevent loss of fine materials due to erosion and degradation of soil structure.

Note: TL SEPSCP = Transmission Line Surface Erosion Prevention and Sediment Control Plan

9.15 Traditional Land and Resource Use

Measures to mitigate potential effects on traditional land and resource use during the construction period are presented in Table 9.15-1.

Table 9.15-1: Traditional Land and Resources Use Mitigation Measures

Category	Mitigation/Management Measure
Dangerous Goods	Transport and store all dangerous goods in compliance with regulatory requirements, including the federal and provincial Transportation of Dangerous Goods Act (1992) and associated regulations, to reduce potential contamination risks to land and resources, as a result of any accident or spill.
Clearing	Undertaking vegetation clearing during least-harm periods for wildlife species (see Table 13.1-1) or conduct pre-clearing surveys (e.g., furbearers, birds, amphibians).
Habitat Compensation	Implement the fisheries offsetting plan (as authorized under the *Fisheries Act)* to mitigate effects on fish.
	Implement the Wetland Management and Compensation Plan to mitigate effects to wetlands.
Migratory Birds	Use line markers to prevent migratory bird collisions with the transmission line.
Heritage Resources	Undertake an AIA for the footprint of the final transmission line alignment, and engaging Aboriginal groups in the field work associated with the AIA.
	As required by the *Heritage Conservation Act* (1996), avoid and protect heritage sites in accordance with Section 9.13.
	The Project Archaeologist will implement the Archaeological and Cultural Heritage Chance Find Procedure (Appendix E) if there is a suspected discovery of archaeological, heritage, cultural, or spiritual resources. The project EM will implement that Paleontological Chance Find Procedure (Appendix H) if paleontological resources are found.

10.0 Fuel Management and Spill Response Strategy

The TL FMSCP has been developed to identify procedures to transport, transfer, dispense, store and manage petroleum products during construction. Common substances that pose a risk include gasoline, diesel, hydraulic fluid, transmission fluid, engine oil and lubricants (grease). The TL FMSCP includes a Spill Response Plan to manage spills and fugitive emissions on the transmission line construction site and in product transportation routes, and a contingency plan for preventing, managing, and containing spills. The TL FMSCP identifies spill reporting thresholds. The Spill Response Plan included in the TL FMSCP is specific to fuels. Spill response to all other chemicals is presented in the CMSTHP.

The TL FMSCP identifies detailed fuel management and transport practices and applicable storage and dispensing standards for various size mobile fuel containers, drums, and tanks likely to be used to support TL construction. Table 10-1 identifies general measures to manage fuel and measures to prevent and mitigate spills during TL construction and operations activities.

Table 10-1: Fuel Management and Spill Control

Topic/Activity	Mitigation/Management Measures
Transportation	Fuel will be transported in containers and vehicles that comply with the federal *Transportation of Dangerous Goods Act* and the provincial *Transport of Dangerous Goods Act* hazard classification.
	Tank trucks must be inspected by a facility registered by Transport Canada and documentation made available upon request. Visual inspections will be done every two years and pressure tests will be done every five years.
	Containers for the transportation of fuel will be labelled to communicate the hazard the material represents, made of a material that is compatible with the transported fuel, and in good condition (not damaged, rusting, or leaking).
	Vehicles for the transportation of fuels will be labelled to communicate the hazard the material represents.
	Tanks and containers with a capacity of greater than 50 gallons (230 litres) used for the transportation of flammable liquids or combustible liquids, shall conform to the requirements for the construction of cargo tanks on tank vehicles.
	Fuels will be transported separately from other hazardous or non-compatible materials.
	Transportation route plans will be designed to minimize the chance of a potential spill and to minimize the effect of a spill, should one occur.
	Transport containers will be properly secured and positioned to allow safe access and handling of containers.
	Containers of 5 gallons (23 litres) or less should be stored in an equipment box (Truck box/slip, Tidy Tanks) of a vehicle, reducing the risk of the container to bounce and spill.
	The slip tank will be regularly inspected for leaks and cracks. The slip tank will be repaired or replaced as required to maintain tank integrity.

Topic/Activity	Mitigation/Management Measures
	The spill response plan and a spill response kit, capable of containing and absorbing fuel spills will be available in all vehicles that are used for the transportation of fuel.
	Employees will be prohibited from smoking in and around fuel transport containers and vehicles.
	All bulk fuel drivers will: • Be trained and have CPPI Drivers Certification Training and Transportation of Dangerous Goods certification course or equivalent; • Be trained in the relevant sections of the TDG Regulations as applicable to their job and have ready access to their certification; • Be trained on the Spill Response Plan and spill reporting requirements both within and outside the mine site boundary; • Ensure no smoking or open flames are used around the fuel stations at any time; • Wear appropriate PPE, including but not limited to, hardhat, glasses, steel toed boots, gloves and high visibility vest; • Yield to larger traffic; • Obey all posted speeds within and outside the mine site boundary; • Have all lights and markers turned on; and • Follow the designated route.
Storage and Inventory Control	Fuel tanks will be CSA approved and comply with regulations and recommended practices described in A Field Guide to Fuel Handling, Transportation, and Storage (BC MWLAP 2002) and the BC Fire Code. Tanks will bear a current Underwriters Laboratories of Canada certification plate or label.
	Fuel will be stored in containers in good condition that are designed and constructed for fuel storage.
	To minimize the risk of fuel leaks during storage of fuel: • All equipment used to store or dispense fuel will be free of leaks. • Fuel storage locations and equipment will be inspected according to a developed inspection program. Fuel storage locations will be visually inspected daily for leaks, spills, and obvious abnormal conditions. Any leakage will be repaired immediately. If tanks are resting on the ground, daily measurements of fuel levels by tank dip and calculation of fuel gain or loss will be taken. • All tanks will be regularly serviced. • Tanks will be filled to an acceptable safe filling level of approx. 90% capacity (MWLAP 2002).
	Fuels will be stored separately from corrosive materials.
	Smoking in and around fuel storage and will be prohibited. Signage will be placed adjacent to all such locations.
	Fuel storage and dispensing will occur at least 30 m from watercourses and wetlands.

Topic/Activity	Mitigation/Management Measures
Handling and Dispensing	All operators will remain with the fuel nozzle while refueling.
	Ignition will be turned off while the vehicle is being refueled or during any other fueling facilities.
	Two approved and current 10 lb BC fire extinguishers must be available within 9 metres of the work area while handling fuel.
	At least one approved and current 20 lb portable fire extinguisher within the tank vehicle.
	Overflow protection must be installed for all tanks where loading and dispensing operations occur.
	After refueling, hose and nozzle and will be stored in a secure and safe position to prevent unnecessary spillage. Hoses will be kept off the ground and valves closed and locked when not in use.
	Do not fuel or service equipment within a riparian management area of a stream or wetland, or within 30 m of a shoreline.
	All storage and transfer locations will also be equipped with appropriate spill kits.
	Reviewing inspection findings on an incident-by-incident basis with operators, transporters, and off-site contractors to correct deficiencies, maintain awareness and communication, and recognize negative or positive performance.
Recordkeeping and Reporting	A database of fuel spills will be maintained on site that will include information on current status of remedial activities, details of inspections, statistics on incidents of spills, and the outcomes of investigations following significant spills.

10.1 Spill Response

Spill response measures shall be in accordance with the TL FMSRP. Table 10.1-1 identifies spill reporting thresholds. The following immediate response actions will be implemented in the event of a spill of fuels, oils, lubricants, or other harmful substances:

- Make the area safe – identify the substance, evaluate immediate risk and warn personnel in the vicinity of the spill.
- Stop the flow (when possible and safe).

Table 10.1-1: Spill Reporting Thresholds and Requirements

Substance	Quantity	External Reporting Requirements	Internal Reporting Requirements[1]
Any Spill	Any amount in aquatic habitat	Emergency Management BC (EMBC), Fisheries and Oceans Canada (DFO) and ENV	Environmental Incident Report (EIR)

Substance	Quantity	External Reporting Requirements	Internal Reporting Requirements[1]
Fuel and Oil	≥ 100 litres	EMBC	EIR
	Any amount off property	ENV and local authority	EIR
Flammable or Non-Flammable Gas	≥ 10 kilograms	EMBC	EIR
Toxic or Corrosive Waste	≥ 5 litres or kilograms	EMBC	EIR
Hazardous Waste	≥ 5 litres or kilograms	EMBC	EIR
Explosives	Any quantity that could pose a danger to the public, or ≥ 50 kilograms	EMBC	EIR

[1] Notification processes to other parties for environmental incidents is outlined in the Accidents and Malfunctions Administration and Communications Plan.

10.2 Spill Reporting Contact Numbers

Not all contact numbers provided in Table 10.2-1 require notification for a particular spill. These numbers are intended to be a quick reference for the Contactor and Environment Manager who will determine the appropriate calls to make based on the particular spill's requirements. Other contact numbers may be added to this table for reference as needed.

10.3 Spill Response Equipment

These supplies and equipment are to be used only for their intended purpose. Under no circumstances will emergency supplies be used in non-emergency situations. Spill response equipment will be located at sites where fuels, oil, and other hazardous materials are stored. They are maintained, inspected, and replenished so that they are available for immediate use. **Note: Any equipment or materials used during a spill must be replaced within 2 weeks following a spill.** A review and inspection program has been developed and will be applied in accordance with the TL FMSCP.

The Health and Safety Manager or their designate will inspect and maintain the emergency supplies. The inspection will be documented, and records retained.

The TL EPC Contractor will have mobile equipment available to control, contain and clean up spills and these will be made available on a priority basis should a spill occur. The equipment may include front-end loaders, excavators, and graders. In the event of a significant spill, the Mine Site will also make their fleet of heavy equipment available to assist in the spill response. These include rock/haul trucks, dozers, front-end loaders, graders, excavators and pumps and storage vessels.

Table 10.2-1: Spill Reporting Contact Numbers

Contact	Phone Number	Contact	Phone Number
Mine Manager (or delegate)	Tim Donnelly 604-558-1107	Emergency Management BC	1 800 663 3456
Environmental Department	Sarah Harrison 250-818-3765	Poison Control	911
Environmental Monitor	TBD	Spills - BC Environment	1 800 663 3456
Chief Inspector of Mines	250-952-0494	Deputy Chief Inspector of Mines	250-952-0471
BC Wildfire: • Phone • Cell	 250 565 6124 *5555	WorkSafe BC: • General • After Hours	 1 888 621 7233 1 866 922 4357
Conservation Office – Vanderhoof	250 567 6304	Department of Fisheries and Oceans (Prince George)	250-627-3499

Office	Phone	Email
Ulkatcho First Nation Office Chief Lynda Price EMoLC Representative – Vanesa Gottfriedson	250-742-3260	chief@ulkatcho.ca Vanessagottfriedson@ulkatcho.ca
Lhoosk'uz Dené Nation Chief Liliane Squinas Councilor June Baptiste EMoLC Representative Laurie Vaughn – Band Administrator Jeana Moore - Director	250-992-3290	lsquinas@lhooskuz.com Tsunie@lhooskuz.com Bandadministrator@lhooskuz.comNeba_nduwhulh'ih@lhooskuz.com
Nadleh Whut'en First Nation Chief Marten Louie EMoLC Representative – Kirsten Chapman Rose DaSilva	250-690-7211, ext. 113	chunih@nadleh.ca
Stellat'en First Nation Chief Robert Michell EMoLC Representative – Doug Casimel/ Isaiah Reynolds	250-699-8747, ext. 31	Chief@stellaten.ca
Saik'uz First Nation Chief Priscilla Mueller EMoLC Representative – Kasandra Turbide	250-567-9293, ext. 220	priscilla.mueller@saikuz.com

Office	Phone	Email
Nazko First Nation Chief Leah Stump EMoLC Representative - Stephanie Deneault and Florian Bergoin	250-992-9085	leahstump@nazkoband.ca
Skin Tyee Nation Chief Rosemarie Skin	250-694-3517	chief@stfn.ca
Tŝilhqot'in Nation Chief Joe Alphonse	250-392-3918	TBC
Métis Nation British Columbia Collete Trudeau (Chief Executive Officer)	604-557-5851	ctrudeau@mnbc.ca
Nee-Tahi-Buhn Band Chief Marcella Morris	250-694-3494	Marcella.morris@ntbb.ca

There are generally three types of spill kits that the EPC Contractor will need to supply and make available. It is noted that since there are no permanent facilities for storage along the TL construction corridor and RoW, it is recommended that temporary storage of spill supplies inventory be provided by seacans that can be relocated as necessary along the TL construction corridor based on the location of construction activities over time.

10.3.1 Level "A" Spill Response Kit – Dedicated Seacan Storage

A large supply of spill response equipment, including PPE for oil, is kept in a container that is immediately available should a large incident occur. It will be clearly identified and readily accessible. Spills of several hundred litres or more can be cleaned up using this equipment. Refer to Table 10.3-1 for Level "A" Spill Response Kit contents and Table 10.3-2 for PPE.

Table 10.3-1: Level "A" Main Spill Response Depot – Mobile Seacan on TL Access Road

Quantity	Item	
1	Container with lid or shed; includes inventory list	
8 bales	Sorbent booms (4 per bale)	10' × 5"
1 length	PVC 6x6 River Boom	25'
10 bales	Sorbent pads (100 pads to a bale)	
6 bales	Sorbent socks (12 per bale)	3" × 4'
1	Sorbent roll (150' × 30")	
1	Sledge hammer	6 lbs
1 set	Tools (wire cutters, pliers, hammer, utility knife, nails)	
1	Pipe for inverted weir	8' × 4"

Quantity	Item	
1	Watergate® Barrier or equivalent	
40	Heavy-duty oil spill disposal bags	
2	“No Smoking” signs	
1 roll	“Caution Do Not Enter” tape	
4	Safety triangles	
2	Poly tarps (18' × 20')	
1 jar	Plug N’ Dike	
4	Round-nose shovel	
200 feet	Polypropylene rope	1/4"
1 box	Rags	

Table 10.3-2: Personal Protective Equipment

Item	Quantity/Size
Coveralls (Tyvek or Saranex)	12-XL, 12-XXL
Oil-resistant rubber boots	12 pairs
Chemical splash goggles with side shields - A/O (fit eyeglasses)	12 pairs
PVC, rubber, leather, and nitrile gloves	12 pairs
Dust respirators (NIOSH-approved)	12
Cartridge respirators (NIOSH-approved)	12
Cartridges for respirators (organic vapour, acid, base)	12
SCBA, positive pressure full face piece	6
Level B chemical suits (Hazmat)	6
Life vests (Personal Flotation Devices)	6
Rain gear sets	6XL, 2-XXL, 3XXXL
High visibility vests	6
Fire proximity suit	6
Gas monitors/detectors	3
Hearing protection	5 packages
Sunblock	12-75 ml – SPF 60

10.3.2 Level “B” Spill Response Kit – Secondary Fuelling and Storage

Smaller caches of spill response materials will be kept at all temporary fuel storage and transfer areas and clearly identified and readily accessible. For each construction spread, it is recommended that two Level “B” kits be strategically positioned for emergency use. Spills of up to several hundred litres can be cleaned up using this kit. Refer to Table 10.3-3 Level “B” Spill Response Kit contents.

Table 10.3-3: Level “B” Spill Response Kit – Fuel Storage and Dispensing Areas

Quantity	Item	
1	Container to store all major response items, inventory list	
10	Sorbent socks	3" × 4'
3 bales	Sorbent pads (1 bale in kit, 2 to be stored)	18" × 18" × 3/8"
20	Heavy-duty oil spill disposal bags	
1	Round-nose shovel	
1 pair	Chemical goggles - A/O (fit eyeglasses)	
2 pair	PVC gloves	
1	Poly tarp	18' x 20'
2	“No Smoking” signs	
1 roll	“Caution Do not Enter” tape	
200 feet	Polypropylene rope	1/4"
1 box	Rags	
1 unit	Plug N’ Dike	

10.3.3 Level “C” Spill Response Kit – Mobile Equipment Kit

Small caches of spill response materials will be kept in a carrying case or other container with all slip tanks, on each piece of mobile equipment (including pickups), and near small fuel-powered equipment (e.g., trash pumps, generators, etc.). They will be clearly identified and readily accessible. Spills up to several tens of litres can be cleaned up. Refer to Table 10.3-4 Level “C” Spill Response Kit contents.

Table 10.3-4: Level “C” Spill Response Kit – Mobile Equipment Kit

Quantity	Item	
1	Carrying bag or case, inventory list	
4	Sorbent socks	3" × 4'
20	Sorbent pads (10 Oil, 10 Universal)	18" × 18" × 3/8"
5	Heavy-duty oil spill disposal bags	

Quantity	Item
1 pair	Chemical goggles - A/O (fit eyeglasses)
1 pair	PVC gloves
1 roll	“Caution Do not Enter” tape
1 unit	Plug N’ Dike

10.4 Petroleum Tanks

Petroleum products, mainly diesel and gasoline, will be used at various locations along at TL corridor construction sites to power machinery and mobile equipment. There will be no permanent dedicated fuel storage tanks, however there may be some stationary tanks that are skid-mounted. The TL FMSRP provides regulatory standards for the storage, dispensing and transporting of fuel as follows:

- Transporting Standards for Small Fuel Containers & Drums (Less than 230 L);
- Storage, Dispensing, Transporting Standards for Truck Box (“Tidy”) Tanks less than or equal to 450 L – Diesel Only;
- Transporting Standards Tanks Greater than 450 L used to Transport Fuel; and
- Storage and Dispensing Standards Large Stationary Tanks (Generally Greater than 3000 L) used to Transport Fuel.

A visual inspection will be completed daily on each fuel storage tank greater than 230 L. Inspections will include tanks, hoses, connections, valves, gauges and metres, and inventory records.

Fuel transfer procedures will include best management steps to mitigate for overtopping of tanks or spillage. In addition, inventories will be tracked regularly to check on any possible losses. All spills or accidents will be reported immediately. Personnel responsible for transporting or storing hydrocarbons or for fuelling vehicles will receive training in proper operating procedures, spill cleanup and emergency response.

10.5 Effectiveness Monitoring

Post-spill evaluation, monitoring and remediation requirements are provided in Section 10 of the TL FMSCP.

11.0 Emergency Response

A TL Emergency Response Team (ERT) will be assembled from Project personnel to implement the TL Emergency Response Plan, organized and led by the Health and Safety Manager. Reliance on local EMS from VH, Endako through tiered response agreements when working on those phases will be negotiated. The TL Emergency Response Plan outlines the responsibilities and duties of the ERT in the event of an emergency. The TL ERT will receive training in:

- Incident Command System;
- Communication protocol;
- First aid;
- Firefighting;
- Rescue techniques; and
- Hazardous material handling and clean up.

The TL ERP covers all TL facilities and work areas, is applicable to all Project phases, and will be activated if a Project-related emergency and/or relevant incident occurs. The TL EPC Contractor will provide their own specific Emergency Response Plan that will based entirely on the approved TL ERP and will be provided to regulators and an addendum to the MERP.

12.0 Project Orientation

Training and communication are essential to the successful application of the TL CEMP. All TL site personnel are expected to understand the TL CEMP's primary objectives and key mitigation measures, and their responsibilities to enable successful implementation of the plan. Relevant site personnel (i.e., management and supervisors) are expected to have a comprehensive understanding of the TL CEMP and its requirements as it relates to their job function. Other personnel are expected to have a basic understanding of the TL CEMP, with knowledge specific to their job function.

To achieve broad awareness of this TL CEMP, TL personnel must attend a one-time orientation session upon arrival at the Project site that includes cultural awareness and sensitivity training, site-specific safety and environmental components. Orientation materials specific to the environment will be prepared by BW Gold, and delivery of the orientation sessions will be a collaboration between BW Gold staff and the EPC Contractor's Environmental Representative. Refresher training intervals for site onboarding are to-be-determined, however, regular crew Tailgate Meetings will cover the relevant seasonal aspects of the topics below as a result of on site observations and throughout an annual period.

Personnel must sign and date the orientation record confirming that they have received the indoctrination materials and presentation. Signed environmental orientation meeting records must be provided to the Training Manager and retained on record as required by the Health, Safety and Reclamation Code for Mines in British Columbia (BC EMLI 2022).

From an environmental perspective, the orientation will include the following topics:

- TL CEMP orientation;
- Access road use and haulage operating protocols;
- Restricted access and recreation rules;
- No hunting / no fishing policy;
- Wildlife observation and interaction reporting procedures;
- Caribou awareness program;
- Bear awareness program;
- Fish habitat and wetland awareness;
- Waste management procedures;
- Wildlife-human interaction procedures including management of wildlife attractants;
- Wildlife sensitive locations/timing as applicable;
- Hazardous material management;
- Project site waste procedures;
- Erosion prevention and sediment control;
- Invasive species;
- Soil conservation awareness;
- Best management practices for working in environmentally sensitive areas;
- Chance Find Procedure;
- Emergency procedures including spill response and incident reporting;
- Wildfire preparedness and response; and
- TL ERP orientation.

Refresher training will be provided to all employees annually or following a significant incident warranting refresher training to all staff. Additional site- and task-specific training will be provided to site workers as required.

13.0 Timing and Pre-construction Planning

A critical element in minimizing impacts on environmental features while advancing construction is coordination between the construction schedule, wildlife restriction periods, pre-clearing surveys, and planning for mitigation measure implementation. Contractors will be required to provide accurate and timely construction and mobilization schedules in advance of work so that pre-clearing surveys, if required, can be carried out and the findings incorporated into construction planning. Contractors will be required to furnish BW Gold with these materials several months ahead of construction. In addition, routine day-to-day scheduling coordination between contractors, BW Gold staff, and Environmental Monitors will be required.

A mechanism for posting and distributing live schedules will be established.

13.1 Fish and Wildlife Restriction Periods

Timing restriction periods exist for certain fish and wildlife species that require management during construction activities. These periods, and associated mitigation activities for the selected fish and wildlife species are summarized in Table 13.1-1. Fisheries timing windows are provided for awareness only as there is no “in-stream” work, only some near-water and riparian. The table includes timing restrictions from the following sources:

- Federal and provincial legislation;
- Commitments recorded in the Blackwater Mitigation Table submitted to the BC EAO;
- Mitigation measures associated with pre-construction surveys recorded in Condition #23 of the EAC; and
- BC guidelines and Best Management Practices (BMPs), including:
  - A Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia (FLNRO 2014),
  - BMP for Bats (BC MOE 2016),
  - BMP for amphibians and reptile salvages (FLNRO 2016), and
  - Terms and Conditions for changes in and about a stream specified by MWLAP Habitat Officers, Omineca Region (FLNRO 2004).

13.2 Pre-Construction Surveys

Project construction activities that may disturb wildlife (e.g., vegetation clearing), will be avoided during activity restriction periods wherever possible (Table 13.1-1). If avoidance is not possible during these periods, pre-construction surveys will be conducted in accordance with EAC Condition #23 and the WMMP to identify features that must be avoided and mitigation measures implemented. Pre-construction surveys will be completed under the direction of QPs.

The Contractor’s Environmental Representative will be familiar with pre-construction survey requirements and management plans which may require pre-construction surveys, and ensure that construction scheduling incorporates sufficient lead time for QPs to complete surveys.

Surveys will be specific to the season using species-specific survey methods to locate nests. The EM will keep a log of when pre-construction surveys were conducted and the results, including a log of all mitigation actions applied. These include setbacks established around habitat features such as dens and nests.

Table 13.1-1: Timing Windows for Fish and Wildlife Species during Construction

Valued Component	Specified Period	Season/Habitat for Feature	Summary of Mitigation	Guideline Buffers (m)	References
Rainbow trout	Jul 15 – Apr 15	All Watercourses	• No in-water work (includes all water bodies: watercourses, lakes, wetlands etc.).	30 m	*Fisheries Act; Water Sustainability Act;* BC FLNRO 2004
Bull trout	Jun 15 – Aug 15	All Watercourses	• No in-water work (includes all water bodies: watercourses, lakes, wetlands etc.).	30 m	*Fisheries Act; Water Sustainability Act;* BC FLNRO 2004
Dolly Varden	Jul 15 – Aug 31	All Watercourses	• No in-water work (includes all water bodies: watercourses, lakes, wetlands etc.).	30 m	*Fisheries Act; Water Sustainability Act;* BC FLNRO 2004
Mountain Whitefish	Jun 1 – Sep 15	All Watercourses	• No in-water work (includes all water bodies: watercourses, lakes, wetlands etc.).	30 m	*Fisheries Act; Water Sustainability Act;* BC FLNRO 2004
Kokanee	Jun 1 – Aug 31	All Watercourses	• No in-water work (includes all water bodies: watercourses, lakes, wetlands etc.).	30 m	*Fisheries Act; Water Sustainability Act;* BC FLNRO 2004
Chinook	There is no timing window available from DFO or the province	All Watercourses	• No in-water work (includes all water bodies: watercourses, lakes, wetlands etc.).	30 m	*Fisheries Act; Water Sustainability Act;* BC FLNRO 2004
Sockeye	There is no timing window available from DFO or the province	All Watercourses	• No in-water work (includes all water bodies: watercourses, lakes, wetlands etc.).	30 m	*Fisheries Act; Water Sustainability Act;* BC FLNRO 2004

Valued Component	Specified Period	Season/Habitat for Feature	Summary of Mitigation	Guideline Buffers (m)	References
Amphibians: Western Toad	Apr 1 – Sep 30	Wetlands (breeding habitat)	• If clearing is required during the breeding season, conduct pre-construction surveys to identify breeding habitat, and pre-clearing surveys to confirm occupancy; • Establish buffer zones around breeding habitat; • Amphibian salvage will be conducted if necessary, in consultation with ECCC and Indigenous Nations.	30 m	BC MOE 2014b; ECCC 2016; MFLNRO 2016
Bats: Little Brown Myotis and Northern Myotis	Roosts: May 15 – Sep 30 Hibernacula: Oct 1 – May 31	Roosts (summer), Hibernacula (winter)	• Pre-construction surveys to determine the distribution of little brown myotis and northern myotis; • Establish buffer zones around active hibernacula and active roosts: – Contact FOR if Project activities will occur within a roost buffer; and – Monitor buffer zones for ongoing use. • If surveys identify loss of little brown myotis and northern myotis roosting habitat, implement offsetting through roosting structures maintained throughout the life of the mine.	100 m - 1 km	BC MFLNRO 2014; Holroyd and Craig 2016

Valued Component	Specified Period	Season/Habitat for Feature	Summary of Mitigation	Guideline Buffers (m)	References
Birds: Forest and Grassland Birds, and Waterbirds	Apr 15 – Aug 31 Clark's Nutcracker (Whitebark Pine habitat only): Mar 15 – Jul 30	Nests, eggs, young, and mature	• Pre-construction surveys for habitat of species at risk; • If clearing required during breeding bird window, conduct pre-clearing surveys for bird nests; – Surveys will include habitat considerations and protocols for species at risk, see Section 4.1.7. • Establish buffer zones around active nests.	30 m - 100 m	ECCC 2017, 2019; Birds Canada 2021
Raptors	Mar 15 – Aug 15	Nests, eggs, and young	• If clearing required during raptor breeding window, conduct pre-clearing surveys to identify raptor nests in suitable habitat: mature forest, riparian, or cliff areas; • Establish buffer zones around active nests; and • Apply for permits to remove or relocate unoccupied nests if necessary.	100 m - 500 m	BC *Wildlife Act* 1996b; BC MOE 2013; Birds Canada 2021
Caribou	Jan 15 – Jul 15	Ungulate Winter Range	• Conduct pre-construction surveys for caribou habitat and mineral licks; • If caribou are observed on site during construction or operations, work will be stopped or managed (by the EM) in accordance with the WMMP to reduce disturbance to caribou; and • Aircraft minimum altitude 400 m in the UWR where possible.	-	BC MFLNRO 2014

Valued Component	Specified Period	Season/Habitat for Feature	Summary of Mitigation	Guideline Buffers (m)	References
Furbearers and Grizzly Bear	Fisher: Mar 15 – Jun 30 Wolverine: Feb 1 – Jun 30 Grizzly Bear: Oct 1 – Apr 15	Dens	• If clearing required during denning period, conduct pre-construction surveys for denning habitat of: – American marten; – Fisher; – Grizzly bear; and – Wolverine. • Establish buffer zones around denning features, including suitable denning habitat for fisher or marten denning, although dens will not be individually identified (Section 8.5, WMMP).	60 m (Grizzly Bear) 500 m (Wolverine)	BC MFLNRO 2014

14.0 Project Meetings

14.1 Kickoff Meetings

At the start of construction particularly prior to starting clearing, construction, or mobilization of a new area, a kickoff meeting will be held to review and discuss the scope and timing of activity. The meeting(s) will confirm working relationships and communication protocols, awareness of regulatory requirements, environmental sensitivities, mitigation measures, pre-clearing survey requirements, personnel and resource needs, agency notifications/permit conditions, schedule constraints and risks, hazard review, and safety performance. Key regulatory permits, approvals, TL CEMP requirements, and mitigation measures will be reviewed. A key outcome of task meeting is confirmation of environmental monitoring resource needs and to confirm the work has been planned effectively to avoid foreseeable environmental impacts.

Contractors will be responsible for ensuring that their personnel and subcontractors are appropriately trained and competent to implement the requirements of the TL CEMP and relevant management plans. Contractors shall ensure attendance of their personnel at kickoff meetings and Tailgate Meetings.
The BW Gold and/or Environmental Monitor will provide additional and site-specific environmental information and background at Progress Meetings and crew Tailgate Meetings. The BW Gold and or EPC Environmental Monitor will also be on site in the field during construction activities to raise awareness and understanding of environmental matters.

14.2 Progress Meetings

Regular Progress Meetings will be held monthly, chaired by the BW Gold CM, and will include representation from all relevant parties including the BW Gold and EPC EM and Independent Environmental Monitor. Minutes of these meetings will be maintained by the BW Gold CM.
The environmental portion of these meetings will include, at a minimum, the following:

- A review of recent activities, and a discussion of any environmental concerns that should be communicated to the group;
- Identification of seasonal changes that will affect construction planning (e.g., activity restriction timing);
- Detailed review of any recent incidents, investigation findings and follow-up actions;
- An overview of upcoming work planned, and schedules;
- Review of contractors/personnel on site or coming to site and associated training requirements; and
- Communication of any updates/revisions to the TL CEMP.

14.3 Tailgate Meetings

Daily tailgate meetings at the crew level will be held to provide instruction in safety, environmental awareness, and task assignment. Tailgate Meetings will include a safety briefing, an overview or update regarding environmental sensitivities at a site that may be affected by construction activities, planned activities and map review, and awareness of mitigation measures/boundaries/working area and communication protocols from the BW Gold and or EPC EM and Contractor's Site Superintendent(s). Tailgate meetings, including content pertaining to environmental management and protection, will be documented by the EPC Contractor.

Should conditions change during daily work at a construction site such that environmental risks increase (e.g., heavy rainfall and increased risk of sediment and erosion problems affecting adjacent watercourse), then crews are expected to respond, hold a tailgate meeting, and address environmental risks and mitigation due to changing conditions.

15.0 Monitoring Program

Successful implementation of the TL CEMP will require an ongoing process of monitoring, reassessment, and modification. At its most fundamental level, a successful monitoring program involves all site personnel. Keeping personnel trained and informed of the goals and purpose of the TL CEMP promotes a conscientious approach to environmental management. Site personnel will be properly equipped with the appropriate training and tools, and will fully understand their individual responsibility in implementing the TL CEMP. These “informal” inspections by all personnel are augmented by formal, regularly scheduled inspections performed by the Environmental Monitor or qualified professional. At a minimum, there will be one full-time Environmental Monitor on site during construction; Aboriginal Monitors will be on site in accordance with the Aboriginal Group Monitor and Monitoring Plan (EAC Condition 16). The Environmental Monitor will focus on site-wide construction monitoring activities in accordance with the TL CEMP. The frequency of monitoring will be based on the level of risk. For example, the Environmental Monitor will monitor high-risk activities, such as watercourse crossings, at an hourly/daily frequency during the activity. Lower-risk activities, such as gravel placement for a roadway, will be subject to weekly monitoring. The Environmental Monitors will work with the EM to determine daily and weekly monitoring priorities, and the number of resources required should there be several high-risk activities occurring simultaneously, based on construction activities. The Environmental Monitor will be supported by subject matter experts as required.

Accurate, detailed, and standardized records will be kept throughout the monitoring program to support status reporting to Project management, regulatory agencies, and stakeholders.

15.1 Soils Monitoring

At a minimum monitoring will include daily visual inspections during stripping to confirm that: (1) weather and soil moisture conditions are appropriate for salvage; (2) all target reclamation material is being salvaged, as practical; (3) suitability criteria defined in are being applied; (4) target salvage depths are being achieved; and (5) reclamation materials are being appropriately segregated.

15.1.1 Effectiveness Monitoring

The TARP associated with soils monitoring is provided in Table 9.1-3 of the Soil Management Plan.

15.2 Air Quality Monitoring

Visual monitoring of dust will be undertaken in accordance with the Fugitive Dust SOP (excluding Section 5.4). Construction personnel will be trained to be observant for dust related concerns which may arise. These observations, together with meteorological conditions and mitigation efforts taken to deal with a problem, will be recorded and included in monthly and annual reports. Visual monitoring will focus on areas where there are active surface earthworks and heavy traffic.

15.3 Erosion and Sedimentation Monitoring

Section 7 of the TL SEPSCP details the general erosion and sedimentation monitoring program.

The sedimentation monitoring framework can be found in the TLSMP-FG.

15.4 Vegetation Monitoring

Vegetation monitoring during Construction is summarized in Table 15.4-1.

Table 15.4-1: Vegetation Monitoring Plan

Monitoring Activity	Measurable Parameter(s)	Frequency	Timing
Office and field review of pre-clearing surveys and boundaries	• Pre-clearing survey is completed and sensitive features and mitigation specified; • Boundaries and works zones flagged (RMAs); • Clearing is within LOO and Occupant Licence to Cut permit boundary; and • Clearing work windows are identified and work is during the correct window.	Variable	Prior to clearing occurring
Vegetation clearing	• Clearing dimension size in relation to planned activity; and • Avoidance of rare plants, ecosystems at risk, riparian areas through implementation of pre-clearing survey, flagging, and mitigation measures.	Variable	When clearing is occurring
	Clearing work windows: • Breeding bird season refer to the WMMP (Table 3.3-1).	Variable	When clearing is occurring
Post-clearing revegetation	• Total area disturbed (m^2); • Total area (m^2) revegetated and the specific prescriptions; • Permanent revegetation plots including vegetation species cover, composition, diversity and, invasive plant species; • Documentation of evidence of erosion including sheet erosion, rills, gullies; • Periodic inspections of the re-vegetated areas to assess performance objectives (including photos) compared to prescription targets; and • Evaluation of the success of the revegetation prescriptions in meeting site objectives and, if required, identification of additional mitigation activities.	Annual	May to October
Post-clearing windthrow monitoring	• The effectiveness of windthrow reduction measures used; • The number and species of wind-thrown trees; • The approximate area affected; and • Bark beetle presence (e.g., Douglas-fir or spruce bark beetle).	Once	Post-construction
Vegetation maintenance	• Document management actions in RMAs to confirm consistent with RMA mitigation measures.	Variable	When activity in RMA occurs

Monitoring Activity	Measurable Parameter(s)	Frequency	Timing
Woody debris management	• Volume of wood cut (identified in License to Cut); • Volume of wood stockpiled or used for progressive reclamation; • Volume of wood disposed of or sold; • Assess fire hazard of stored woody debris; and • Bark beetles present that may cause forest health issues (e.g., Douglas-fir or spruce bark beetle).	Annual	April to October (fire hazard assessments); May to August (beetle assessments)

15.4.1 Invasive Plants

Invasive plant monitoring associated with the TL will be incorporated into an integrative management approach, consistent with other major TL operators in the province (e.g., BC Hydro, Fortis BC). Vegetation management is conducted on a cyclical basis, and the length of the cycle will vary depending on final species composition and growth rates. Generally, the cycle ranges from 4 to12 years. The first management evaluation will be completed 2 years post-construction of the transmission line, and the cycle frequency for subsequent management will be determined at that time.

Further details on invasive plant monitoring, control activities and frequency is provided in the in the TL IVMP.

15.4.2 Effectiveness Monitoring

A TARP associated with vegetation monitoring is provided in Section 11 of the TL IVMP. The TARP provides response actions for deviations associated with the following metrics:

- Total cleared area (ha);
- Pre-clearing survey and flagged clearing boundaries;
- Management Area zones and mitigation followed;
- Revegetation;
- Windthrow;
- Woody debris: volume, bark beetle, and fire hazard assessments; and
- Vegetation maintenance.

15.5 Wetland Monitoring

A summary of the wetland monitoring program that will be undertaken during TL construction is provided in the following sections. Further details, including methods, can be found in the WMOP (ERM 2022).

15.5.1 Pre-clearing

Prior to the start of TL construction, BW Gold will conduct any final wetland surveys that are needed to fill any outstanding gaps in information, as well as to satisfy any pre-clearing regulatory survey requirements and or minor adjustments to the location of access roads or transmission tower locations during the final design phase of the Project. These surveys will be completed at the direction of the QP. Any survey

results will be provided to the IAAC, EAO and Indigenous nations. The survey results will be used to refine the current wetland balance amount of wetland loss requiring compensation. The results will further define constraints mapping for integration in the TL CEMP.

15.5.2 Post-construction Wetland Loss

The extent, location, and type (class and association) of wetlands impacted by the development of the Project will be recorded in a GIS database using pre-construction polygons a base layer overlain by as-built survey results and reviewed by a QP. This database will be updated annually to record all actual wetland losses. The baseline surveys and assessment conclusions were conservative and overestimate the area of impacted wetlands so an accurate accounting of each affected wetland will help confirm EA predictions and determine the overall requirements for offsetting.

15.6 Wildlife Monitoring

15.6.1 Pre-construction

Amphibians

DS Condition 8.10 requires that if construction cannot be planned to avoid the sensitive periods identified in Condition 8.9, then pre-construction surveys will be conducted to identify western toad breeding habitat.

Field surveys during the baseline program (2011 to 2013) identified breeding ponds for western toad inside the planned Project footprint. Sources of current breeding ponds will be identified using these baseline data and pre-construction surveys in the mine site and transmission line right-of-way. Surveys will follow standard methods for pond breeding amphibians described in *Inventory Methods for Pond-Breeding Amphibians and Painted Turtle (*RIC,1998 #2294).

Pre-construction surveys were conducted during the summer of 2021 following standard time-limited visual encounter survey protocols, searching ponds for adults, tadpoles, and metamorphs. These data are being presented in a 2021 baseline report which will be incorporated into the WMMP and this TL CEMP. Maps and breeding locations reported during baseline studies in 2013 will also be included in this report. Data will be used to inform plans for clearing, taking into account sensitive periods.

Bats

Both DS and EAC Conditions require pre-construction surveys to be conducted to determine whether hibernacula and roosts occur and their distribution (P 23c, DS 8.14, 8.15).

Hibernacula surveys include:

- The mine site and TL RoW will be searched for rock outcrops and these areas searched for cave entrances. If cave entrances are found, then Autonomous Recording Units (ARUs) will be used to record whether bats are using these caves as hibernacula.
- During the fall, concurrent with other surveys, the buildings of the existing camp will be searched for signs of bats using buildings as hibernacula.

Roost surveys include:

- The mine site (and a buffer surrounding the mine site) and TL RoW will be searched for wildlife trees and snags (dead, standing mature trees) in suitable roosting habitat – near foraging habitat such as wetlands where insects are abundant. Wildlife trees will be marked and their position recorded.

- Wildlife trees will be searched for signs of bat roosts – lifted bark, droppings, and sounds.
- Methods for roost surveys will take into account FLNRO (2014) Section 2.4.1.
- Autonomous Recording Units will be placed in wetlands to determine if bats are present in these areas.

In accordance with EAC Condition 23.C Table 1, an inventory will be kept of features that may function as hibernacula and roosts. If it is not possible to conduct clearing outside of the sensitive season for bats, then pre-clearing surveys would be conducted at these features and mitigation applied including setback buffers.

Pre-construction surveys were conducted during the summer of 2021 for the hibernacula and roost surveys described above. These data are being presented in a 2021 baseline report which has incorporated into the WMMP. Maps and breeding locations reported during baseline studies in 2013 will be included in the WMMP.

Caribou

The TL corridor is outside the Tweedsmuir Local Population Unit; and is in Type 2 matrix range and therefore encounters with caribou are highly unlikely. Please refer to the Caribou Mitigation and Monitoring Plan for more information.

Moose

Condition 23d of the EAC directs BW Gold to conduct pre-construction surveys to confirm or update the habitat suitability mapping for moose:

> *"the means by which information from the habitat suitability mapping for the Project Site will be confirmed or updated for the use of the Project Site by grizzly bears and moose prior to Construction at the Project Site, and in consultation with Aboriginal Groups."*

Pre-construction field surveys were undertaken in summer 2021 to conduct habitat suitability field validation for several key species, including moose, in the mine site and transmission line right-of-way.

Pre-construction surveys:

- Followed British Columbia Wildlife Habitat Ratings Standards;
- Were conducted by wildlife biologists with members of Aboriginal Groups;
- Considered existing terrestrial ecosystem mapping of the project site to identify habitat types for further assessment;
- Will be used to evaluate the existing habitat suitability mapping, with data and results reported in a 2021 baseline wildlife report; and
- A technical report and report for lay audiences will be delivered to Aboriginal Groups at least 60 days prior to the start of construction at the Project site.

Condition 23c of the EAC and federal condition 8.6 require BW Gold to conduct pre-construction surveys for habitat features for moose, including mineral licks. Federal condition 8.2 also requires that the locations where wildlife corridors cross Project roads be identified and wildlife crossing signs be installed prior to construction.

Provincial standards or guidelines do not exist for identifying mineral licks and trails. Field surveys for licks were conducted during summer of 2021 and included walking surveys in the mine site and transmission line right-of-way during other surveys (habitat suitability mapping, birds, and amphibians) with incidental reporting of salt licks whenever they were observed. Surveys for wildlife corridors included driving and

walking surveys along project roads to identify trails and wildlife sign. These data will be reported in a 2021 baseline wildlife report and have been incorporated into the WMMP, along with any comparable data collected as part of baseline studies 2011-2013 and 2016-2017.

Furbearers

Pre-construction baseline surveys were undertaken in 2021 to conduct field verification of habitat suitability mapping and identify suitable habitat for key species, including denning habitat for furbearers (American marten, fisher, wolverine) in compliance with DS Condition 8.10.

Field surveys for furbearer denning habitat suitability (American marten, fisher, and wolverine) were conducted from June 8 to June 19, 2021 in the mine site and transmission line local study areas. Field survey protocols followed the *Wildlife Habitat Rating Standards* (RIC 1999a).

Survey locations were assessed for abiotic and biotic ecosystem variables, and rated for each species denning habitat suitability using a six-class system from nil to very high. Habitat ratings were further refined in the field based on the plot-in-context, distance to species specific habitat features, and distance to disturbance. Wildlife sign was also recorded at each site to document relative level of use of the site. These data will be reported in a 2021 baseline wildlife report and have been incorporated into the WMMP, along with any comparable data collected as part of baseline studies.

Grizzly Bear

Condition 23d of the EAC requires pre-construction surveys for grizzly bear so that:

> *"…information from the habitat suitability mapping for the Project Site will be confirmed or updated for the use of the Project Site by grizzly bears and moose prior to Construction at the Project Site, and in consultation with Aboriginal Groups."*

Pre-construction field surveys were conducted in the mine site and transmission line right-of-way during the summer of 2021. Surveys and follow up were designed to meet EAC Condition 23d. These surveys:

- Considered existing terrestrial ecosystem mapping of the Project site to identify habitat types for further assessment;
- Followed standard habitat suitability mapping standards in British Columbia Wildlife Habitat Ratings Standards;
- Included Aboriginal Groups working with wildlife biologists to conduct the surveys in the field;
- Will be followed by a 2021 baseline report which evaluates the accuracy of the habitat suitability mapping for the Project;
- Will be followed by an assessment of mitigation measures for grizzly bear, and new mitigations consistent with the BC Environmental Mitigation Policy will be added if required; and
- Will be followed by a technical report and report for lay audiences delivered to Aboriginal Groups at least 60 days prior to the start of Construction at the Project site.

Birds

DS Condition 4.3 requires pre-construction surveys in the mine site and transmission line right-of-way to validate the results of habitat suitability modelling for migratory birds, including migratory birds that are listed species at risk. Survey results will be used to inform mitigation measures for migratory bird habitat and will be incorporated into the WMMP in consultation with Aboriginal groups and Indigenous nations and relevant provincial and federal authorities.

DS Condition 8.16 requires pre-construction surveys for short-eared owl in high-value nesting and foraging habitat.

Pre-construction surveys will include:

- Habitat suitability model validation for migratory birds, including migratory birds that are listed species at risk, conducted by the Proponent and presented in the Application/EIS and Blackwater Gold Project – Waterbird Memo;
- Validation of the applicability of fisher habitat suitability model for interior forest habitats to migratory birds, as identified by in Blackwater Gold Project – Forest Birds;
- Surveys for migratory bird species at risk and their habitat within the LSA to identify any additional mitigation measures required during construction; and
- Identifying areas of the transmission line route which pose a higher mortality risk to birds, for implementation of mitigation measures and follow-up monitoring.

Pre-construction field surveys will be undertaken within the mine site and transmission line right-of-way following provincial protocols for habitat suitability mapping.

- Field surveys for birds are required to ground-truth habitat suitability mapping models. Surveys follow RISC standards and during the breeding bird season one year prior to construction:
- RIC 1998. Inventory Methods for Forest and Grassland Songbirds, Version 2.0;
- RIC 1999. Inventory Methods for Waterfowl and Allied Species, Version 2.0;
- RIC 1998. Inventory Methods for Swallows and Swifts, Version 2.0;
- Knight et al. (2019) Canadian Nightjar Survey Protocol, 2019, which replaces RIC (1998) Inventory Methods for Nighthawks and Poorwills, Version 2.0; and
- RISC 2006. Inventory Methods for Owl Surveys, Version 1.0.

Pre-construction surveys were conducted during the summer of 2021 to accomplish these goals. Species-specific surveys were conducted for several species at risk that require specialized surveys due to their unique natural history. The data from these surveys will be reported in a 2021 baseline wildlife report. Based on the results of pre-construction surveys conducted in 2021, mitigation measures will be updated, as necessary, in consultation with Aboriginal groups and Indigenous nations and relevant authorities.

15.6.2 Pre-clearing

Furbearers

If construction is scheduled during sensitive time periods, pre-construction surveys will be conducted to identify American marten, fisher, and wolverine denning habitat (WMMP Table 4.5-1; DS 8.9, 8.10). Planning for surveys and adaptive management for probable active dens will be in consultation with FOR and Aboriginal groups and Indigenous nations. Surveys will generally follow *Inventory Methods for Medium-Sized Territorial Carnivores – Coyote, Red Fox, Lynx, Bobcat, Fisher, and Badger, Version 2.0* (RIC 1999b). Ground-based surveys, stratified by habitat suitability, will be conducted in winter prior to any clearing or construction in the sensitive period. Detailed surveys methods are provided in Section 4.5.2.1 of the WMMP.

Grizzly Bear

DS Condition 8.10 and EAC Condition 23c indicate that if construction cannot be avoided during the sensitive periods for bears, that pre-construction surveys will be conducted for grizzly bear denning habitat. Detailed surveys methods are provided in Section 4.6.2.1 of the WMMP.

Birds

EAC Condition 23c, Table 1, indicates that if vegetation clearing must occur during the sensitive period, then pre-clearing surveys will be conducted to identify active nests and establish appropriate setback buffers. Detailed surveys methods are provided in Section 4.7.2.1 of the WMMP.

Note that “pre-construction surveys” are conducted to gather information for planning purposes ahead of the construction period. In contrast, “pre-clearing surveys” are conducted in the closest window possible prior to vegetation clearing during sensitive periods (typically within one week), if clearing cannot be feasibly conducted at another time.

15.6.3 Mitigation Measure Effectiveness Monitoring

Wildlife monitoring will be conducted during construction to evaluate the effectiveness of mitigation measures and inform adaptive management. Not all mitigation measures can be directly monitored, but mitigation measures that can be monitored are provided in Table 15.6-1, and further detailed in the Wildlife Mitigation and Management Plan (Appendix 9-H, Section 4).

Additional wildlife monitoring will be initiated during the construction period in support of federal follow-up programs in accordance with the WMMP. However, this work has long-term objectives (e.g., Population-level monitoring) and the results will likely not provide meaningful opportunity for adaptive management at the timescale of construction (i.e., 14 months) therefore is not included in Table 15.6-1.

Table 15.6-1: Mitigation Measure Effectiveness Monitoring for Wildlife

Potential Effect	Wildlife Valued Components	Mitigation	Monitoring Method	Frequency
Clearing and Construction				
Habitat Loss	Plant Species and Ecosystems at Risk	Clearing and construction mitigations to minimize disturbance (establish targeted no work zones and demarcated buffers)	Report on construction mitigations implemented during clearing	Annual during Construction
Habitat Alteration – Sediment Control	Amphibians, Birds, Plant Species and Ecosystems at Risk	Manage sediment and erosion risks during clearing and construction	Report on sediment control measures implemented	Annual during Construction
Habitat Alteration – Timing Windows	Amphibians, Bats, Birds, Caribou, Furbearers, Grizzly Bear	Conduct clearing and construction during least-harm timing windows wherever practicable, or conduct pre-clearing/pre-construction surveys and implement mitigations	Pre-construction surveys; Report on Project clearing and construction activities	Annual during Construction

Potential Effect	Wildlife Valued Components	Mitigation	Monitoring Method	Frequency
Habitat Alteration – Vegetation Management	Birds, Plant Species and Ecosystems at Risk	Minimize forest edge area, maintain edge habitat, and reduce windthrow risk	Report on forest edge management and windthrow risk assessment	Annual during Construction
	Plant Species and Ecosystems at Risk	Manage equipment and clearing to avoid introduction of invasive plant species	Invasive species monitoring program	Annual during Construction
Habitat Alteration – Wetlands and Riparian Habitat	Amphibians, Insects, Waterbirds	Construction mitigations: no work zones, vegetated buffers, sediment/erosion control, waste management	Wetlands monitoring program	Annual during Construction
	Amphibians, Birds, Plant Species and Ecosystems at Risk	Manage drainages to minimize loss or diversion of drainage systems	Report on drainage management measures	Annual during Construction
Disturbance	All	Incidental reporting of wildlife	Incidental reporting of wildlife, wildlife cameras	Annual during Construction
	All	Training personnel on wildlife policies and mitigation measures - conduct onboarding and refreshers	Report on number of personnel who have undergone onboarding and refresher trainings	Annual
	Caribou	Stop nearby work if caribou are observed on the Project site during construction	Incidental reporting of wildlife	Annual
	Caribou, Moose	Identify mineral licks outside of the Project footprint, buffer these areas if the are retained and apply mitigation	Pre-construction surveys; Report on mitigation actions	One time
Roads				
Habitat Alteration	All	Use existing roads and reclaim roads wherever practicable	Length of new roads constructed, and length of roads deactivated or decommissioned following construction, compared to high quality habitat for each VC	One time

Potential Effect	Wildlife Valued Components	Mitigation	Monitoring Method	Frequency
	Caribou, Furbearers, Grizzly Bear, Moose	Manage vegetation to reduce attractiveness of roadsides	Report on vegetation management activities	Annual
Disturbance	All	Establish and enforce set speed limits on access roads	Monitor speed limits	Annual
	All	Avoid using salt on access roads wherever possible	Report on use of anti-icing agents	Annual
	Caribou, Moose, Furbearers, Grizzly Bear	If access roads are plowed in winter, manage snow banks to allow animals to cross	Audit of snow banks; Report on use of anti-icing agents	Annual
	Amphibians, Caribou, Moose, Furbearers, Grizzly Bear	Identify wildlife trails and potential road crossings, provide signage where trails meet roads	Pre-construction surveys, reporting of road incidents, report on signage	Annual

15.7 Archaeological and Cultural Heritage Monitoring

BW Gold has prepared a Transmission Line Archaeological and Cultural Heritage Resource Management Plan specific to the TL.

Archaeological sites will be identified on project maps and flagged in the field in accordance with measures outlined in S.9.13.

The EM and Aboriginal Monitors will monitor these sites during construction. Should impacts be anticipated or found within the setback of a site recommended by the Project Archaeologist, Indigenous nations and Project Archaeologist will be contacted to determine if additional mitigation measures are required. The EM will be debriefed on the proposed mitigation measures.

The EM and Aboriginal Monitors will, on an annual basis, verify that archaeological and CHR remain intact and are unaffected by the Project and check the condition of site protection (i.e., flagging or fencing). Should impacts be observed at sites, the Project Archaeologist (while the Heritage Inspection Permit is valid) and the Archaeology Branch will be contacted to determine mitigation measures. Should impacts be observed at archaeological and CHR sites, the EM will contact Traditional Knowledge Holder(s) of Indigenous nations to discuss mitigation measures.

16.0 Reporting and Record Keeping

Reporting is the responsibility of BW Gold and or the EPC's EM, with delegation as necessary to appropriate personnel. Information provided below is meant to be guidance and if environmental monitoring is being conducted under the Aboriginal Group Monitoring Plan, reporting and record keeping will conform to the requirements of the Aboriginal Groups Monitoring Plan

16.1 Internal Reporting

16.1.1 Daily Report

Environmental Monitors will document field observations and photos in a Daily Environmental Monitoring form.

16.1.2 Monthly Report

The Environmental Monitors will summarize key findings, outcomes, challenges, successes, work areas, incidents, and non-compliance issues in a monthly Environmental Monitoring Report. This report will track issues, provide overview of progress, and support communications related to the Project's progress.

Distribution of the report outside of the Project Team (i.e., BW Gold, Contractor's Management Team, and Environmental Monitors) is the responsibility of BW Gold's and or the EPC EM.

16.1.3 Completion Reporting

A Project Completion Report (PCR) will be prepared by BW Gold and or the EPC Environmental Monitor for distribution to the contractors and BW Gold at the completion of the initial Construction phase. The PCR will contain the following information and provide a high level overview of the extent of the Project construction and environmental successes and challenges:

- Project organization and parties;
- Description of the extent and type of construction across the Project and challenges;
- Communication approach and success;
- Overview of the environmental requirements for the Project;
- Examples of environmental mitigation measures (both successful and inadequate);
- Compliance summary for the nature and type of incidents and environmental impacts;
- Recommendations for improvements for environmental performance; and
- The Environmental Monitor's professional designation and qualifications.

16.1.4 Incident Reporting

Environmental incidents will be communicated by the individual who detects an incident to their superintendent and to the EM.

Incident and non-compliance reports will be prepared by the Environmental Monitor for distribution to the Project Team and any applicable regulatory agencies. Key information to include in the incident report includes:

- The location, cause and nature of the incident;
- Environmental or Project features affected (e.g., road, watercourse, forest land, infrastructure);
- Time, extent, and magnitude/quantity of material or area affected;
- Response and actions to control the incident;
- Any follow-up tasks required, mitigation/remediation/corrective actions, or additional sampling needs;
- Notifications of the incident and communication within and outside the Project team; and
- Typically photographs, GPS location, and a map are included for clarification and understanding of proximity risks.

Environmental incidents during construction can be grouped into two general categories based upon impact magnitude and complexity:

- Minor incidents have no permanent or long-term impact on the environment and are generally small scale in nature with simple remedies and may occur frequently on a construction project; and
- Major environmental incidents are infrequent, can have widespread, permanent, or lethal/toxic impacts, are complex to resolve, and may require extensive remediation or cleanup resources.

Minor incidents with little consequence to the environment will be reported within 24 hours to the Environmental Monitor. Examples of minor incidents include non-compliance with mitigation measures, lack of spill cleanup equipment, and non-compliance with flagging of sensitive areas. Cleanup and remediation of the incident will be the responsibility of the Contractor, in consultation with the Environmental Monitor, to address the causes, potential impacts, and long-term risks. The Contractor's Environmental Representative, with the support of the Environmental Monitor, will complete an Environmental Incident Report Form within 48 hours detailing the root causes, consequence, impacts, remediation approach, recommendations and any photos or maps. The Contractor's Environmental Representative/Manager, Environmental Monitor, and Site Superintendent will review and sign-off on the incident report and provide copies to the Contractor and BW Gold's EM within 48 hours. Minor issues are generally resolved immediately, and no follow-up is required once addressed. Minor issues of similar nature that begin to occur frequently will trigger further investigation.

Major incidents are those with the potential to cause permanent, widespread, lethal, or cumulative impacts: a pollution release to the environment, a contravention of legislation and/or permit conditions, or risk to human health and safety. These incidents are rare, but are more complex and resource intensive to remediate than minor incidents. Examples of major incidents include a major sediment release into a stream and damage to fish habitat or critical wildlife habitat (e.g., bear den).

Major incidents must be reported immediately to the Environmental Monitor, Contractor, EM, and applicable regulatory agencies. The Contractor must immediately respond to control, contain, and minimize any impact on the environment or risk to people. An Initial Incident/Spill Report Form will be completed within the same day as the occurrence by the Contractor's Environmental Representative. The Initial Incident/Spill Report will detail the root causes, consequences, impacts, and remediation approach for the incident as well as any recommendations, photos, or maps.

The Contractor's Environmental Representative and Management Team, the Environmental Monitor and the EPC Contactor, and the EM will conduct an immediate investigation and site visit to prepare a Major

Incident Report and provide copies to the Contractor and BW Gold within 24 hours. External agency and First Nation/stakeholder notification of major incidents is required and will be conducted by BW Gold in accordance with the Accident and Malfunction Communication Plan. Control of a major incident may require assistance from external agencies (e.g., sediment discharge into a sensitive area, etc.) in which case BW Gold will coordinate the response. Extensive follow-up, sampling of the environment and remediation may be required during or after a major incident. A draft Environment Incident Report form is provided in Appendix F.

Additionally, any incidents (human-wildlife interactions where there is active deterrence and direct harm, injury, damage, or wildlife mortality occurs) will have formal incident reporting completed in accordance with Section 5.1.1 of the WMMP. A draft Wildlife Incident Report form for use during the Construction phase is provided in Appendix G.

16.2 External Reporting

16.2.1 Compliance Reporting

Compliance reporting will be subject to the Licence of Occupation permit conditions, Condition #5 of the EAC and BW Gold's statutory requirements.

16.2.2 Environmental Life of Mine Monitoring Committee

BW Gold has established the EMLoC and its terms of reference pursuant to EAC Condition #M19-01, Conditions A(10)(a-c) of the M-246 *Mines Act Permit*, Condition 3.7 of *Environmental Management Act* Permit #110652, which requires that the committee meetings will be the primary venue to provide regular construction updates and report monitoring results.

16.2.3 EAC Annual Reporting

Condition 5 of the EAC sets out reporting requirements. BW Gold must submit a report to the attention of the EAO and Aboriginal Groups on the status of compliance with EAC #M19-01 at the following times:

a) at least 30 days prior to the start of Construction;
b) on or before March 31 in each year after the start of Construction;
c) at least 30 days prior to the start of Operations;
d) on or before March 31 in each year after the start of Operations;
e) at least 30 days prior to the start of Closure;
f) on or before March 31 in each year after the start of Closure until the end of Closure;
g) at least 30 days prior to the start of Post-closure; and
h) on or before March 31 in each year after the start of Post-closure until the end of Post-closure.

BW Gold will submit reports to the EAO and Indigenous nations within the timelines specified in EAC Condition 5.

16.2.4 Federal Decision Statement Annual Reporting

DS Conditions 2.11, 2.12, and 2.13 set out annual reporting requirements related to the implementation of conditions in the DS. Condition 2.14 sets out information sharing requirements related to the annual reports. Reporting will commence when BW Gold begins to implement the conditions set out in the DS. Requirements in DS Conditions 2.11 to 2.14 are presented below.

DS Condition 2.11 requires:

> *"The Proponent [BW Gold] shall, commencing in the reporting year during which the Proponent begins the implementation of the conditions set out in this Decision Statement, prepare an annual report that sets out:*
>
> *2.11.1 the activities undertaken by the Proponent in the reporting year to comply with each of the conditions set out in this Decision Statement;*
>
> *2.11.2 how the Proponent complied with condition 2.1;*
>
> *2.11.3 for conditions set out in this Decision Statement for which consultation is a requirement, how the Proponent considered any views and information that the Proponent received during or as a result of the consultation, including a rationale for how the views have, or have not, been integrated;*
>
> *2.11.4 the information referred to in conditions 2.5 and 2.6 for each follow-up program;*
>
> *2.11.5 the results of the follow-up program requirements identified in conditions 3.14, 3.15, 3.16, 4.5, 5.5, 6.11, 6.12, 6.13, 6.14, 8.18.6, 8.20.5, 8.21, and 8.22 if required;*
>
> *2.11.6 any update made to any follow-up program in the reporting year;*
>
> *2.11.7 any modified or additional mitigation measures implemented or proposed to be implemented by the Proponent, as determined under condition 2.9 and rationale for why mitigation measures were selected pursuant to condition 2.5.4; and*
>
> *2.11.8 any change(s) to the Designated Project in the reporting year."*

DS Condition 2.12 requires:

> *"The Proponent [BW Gold} will provide the draft annual report to Indigenous nations, no later than June 30 following the reporting year to which the annual report applies. BW Gold will consult Indigenous nations on the content and findings in the draft annual report."*

DS Condition 2.13 requires:

> *"The Proponent [BW Gold], in consideration of any comments received from Indigenous nations pursuant to condition 2.12 shall revise and submit to the Agency [Impact Assessment Agency of Canada] and Indigenous nations a final annual report, including an executive summary in both official languages, no later than September 30 following the reporting year to which the annual report applies."*

DS Condition 2.14 requires:

> *"The Proponent [BW Gold] shall publish on the Internet, or any medium which is publicly available, the annual reports and the executive summaries referred to in conditions 2.11 and 2.13, the offsetting plan(s) referred to in condition 3.11, the compensation plan referred to in condition 8.18 and, if required, condition 5.3, the whitebark pine management plan referred to in condition 8.20, the communication plans referred to in conditions 6.15 and 10.5, the reports related to accidents*

and malfunctions referred to in conditions 10.4.2 and 10.4.3, the schedules referred to in conditions 11.1 and 11.2, and any update(s) or revision(s) to the above documents, upon submission of these documents to the parties referenced in the respective conditions. The Proponent shall keep these documents publicly available for 25 years following the end of decommissioning of the Designated Project. The Proponent shall notify the Agency and Indigenous nations of the availability of these documents within 48 hours of their publication."

DS Condition 2.15 requires:

"When the development of any plan is a requirement of a condition set out in this Decision Statement, the Proponent [BW Gold] shall submit the plan to the Agency and to Indigenous nations prior to construction, unless otherwise required through the condition."

16.3 Record Keeping

BW Gold will assume the responsibility of record keeping associated with the TL CEMP. Data will be entered into suitable electronic databases (consideration will be given to programs such as Microsoft Access or SAP). Quality control checks will be preformed by a senior member of the environment team upon receipt of results. Data will be entered in a format and program(s) (such as Microsoft Excel or R Project) that allows for comparison between years and be stored in a single file format for each type of survey or monitoring activity. Monitoring data will be stored for 25 years beyond decommissioning and be made available for review upon request for regulatory inspections and for auditing purposes.

17.0 Evaluation and Adaptive Management

BW Gold will conduct and document quarterly review of the TL CEMP, during TL construction, to assess the effectiveness of mitigation measures.

The TL CEMP is a living document that will evolve over time in response to the results of the construction environmental monitoring program, changing conditions or development at the site, updates to scientific methods, and through consultation and discussions with relevant stakeholders, including Aboriginal groups and Indigenous nations. This process of improvement with changing conditions is referred to as Adaptive Management.

The TL CEMP adaptive management framework contains the following elements:

- **Plan**
  - The TL CEMP includes planned mitigation measures and monitoring programs to meet *Land Act* (Licence of Occupation) and *Forest and Range Practices Act* (Occupant Licence to Cut) permits conditions, and DS and EAC Conditions and BW Gold is engaging with Aboriginal groups and Indigenous nations and relevant federal and provincial authorities on these measures and programs.
- **Do**
  - Implementing the mitigation measures as described in the TL CEMP.
- **Monitor**
  - The TL CEMP includes monitoring programs to detect potential effects and test Application/ EIS predictions.
- **Adjust**
  - The TL CEMP defines qualitative and quantitative triggers to measure the level of change relative to baseline conditions to determine whether construction mitigation measures need to be altered or additional mitigation measures implemented.

18.0 Plan Revision

The TL CEMP is a “living” document and any plan revisions will be made in accordance with the plan this is appended to (Condition 13 – Construction Environmental Management Plan).

19.0 Qualified Professionals

The contents of this TL CEMP have been derived from a number of standalone management plans (see Section 2) prepared by respective qualified professionals, where required. This CEMP has been developed under the direct supervisions of, or reviewed by, the following qualified professional:

ORIGINAL SIGNED

Rolf Schmitt, P.Geo.
Technical Director

EGBC No: 19824

ERM Permit to Practice No: 1001271

20.0 References

Definitions of the acronyms and abbreviations used in this reference list can be found in the Glossary and Abbreviations section.

Legislation and Regulations

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Canadian Environmental Protection Act, 1999, SC 1999, c. 33.

Contaminated Sites Regulation, BC Reg. 375/96.

Declaration on the Rights of Indigenous Peoples Act, SBC 2019, c. 44.

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Fisheries Act, RSC 1985, c. F-14.

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Appendix A Concordance Table with Environmental Assessment Certificate #M19-01 (June 21, 2019)

Table A-1: Provincial Environmental Assessment Certificate Conditions and Location in Plan

Condition	Condition	Location in Plan
Condition 2 (Plan Development)	Where a condition of this Certificate requires the Holder to develop a plan, program or other document, any such plan, program or other document must, at a minimum, include the following information: a) purpose and objectives of the plan, program or other document;	Section 2
	b) roles and responsibilities of the Holder and Employees;	Section 3, Table 3-1
	c) names and, if applicable, professional certifications and professional stamps/seals, of those responsible for the preparation of the plan, program, or other document;	Section 19
	d) schedule for implementing the plan, program or other document throughout the relevant Project phases;	Section 6
	e) means by which the effectiveness of the mitigation measures will be evaluated including the schedule for evaluating effectiveness;	Section 17
	g) schedules and methods for the submission of reporting to specific agencies, Aboriginal Groups and the public and the required form and content of those reports; and	Section 16.1 (Internal Reporting); Section 16.2 (External Reporting)
	h) process and timing for updating and revising the plan, program or other document, including any consultation with agencies and Aboriginal Groups that would occur in connection with such updates and revisions.	Section 18
Condition 3 (Adaptive Management)	Where a condition of this Certificate requires the Holder to develop a plan, program or other document that includes monitoring, including monitoring of mitigation measures or monitoring to determine the effectiveness of the mitigation measures, the Holder must include adaptive management in that plan. The objective of the adaptive management is to address the circumstances that will require the Holder to implement alternate or additional mitigation measures to address effects of the Project if the monitoring shows that those effects: a) are not mitigated to the extent contemplated in the Application; b) are not predicted in the Application; or c) have exceeded the triggers identified in paragraph g) of this condition. The adaptive management in the plan must include at least the following: a) the monitoring program that will be used including methods, location, frequency, timing and duration of the monitoring;	Monitoring programs referenced in this CEMP are derived from the relevant stand-alone management plans. Monitoring reports and adaptive management is considered in those plans.
	b) the baseline information that will be used, or collected where existing baseline information is insufficient, to support the monitoring program;	No baseline information is required to be collected that is specifically associated with this CEMP.
	c) the scope, content and frequency of reporting of the monitoring results;	Monitoring programs referenced in this CEMP are derived from the relevant stand-alone management plans. Monitoring reports and adaptive management reporting is considered in those plans.
	d) the identification of qualitative and quantitative triggers, which, when observed through monitoring required under paragraph d), will require the Holder to alter existing, or develop new, mitigation measures to avoid, reduce, and/or remediate effects;	The CEMP does not include any triggers and will defer to triggers identified in management plans that apply during the Construction phase.
	e) the methods that will be applied to detect when a numeric trigger, or type or level of change referred to in paragraph g), has occurred;	The CEMP does not include any triggers. The CEMP will defer to triggers identified in management plans that apply during the Construction phase
	f) a description of the process for and timing to alter existing mitigation measures or develop new mitigation measures to reduce or avoid effects;	Section 17 Section 18

Condition	Condition	Location in Plan
	g) identification of the new and/or altered mitigation measures that will be applied when any of the changes identified in paragraphs a) to c) occur, or the process by which those will be established and updated over the relevant timeframe for the specific condition;	Monitoring programs referenced in this CEMP are derived from the relevant stand-alone management plans. Monitoring reports and adaptive management is considered in those plans.
	h) the monitoring program that will be used to determine if the altered or new mitigation measures and/or remediation activities are effectively mitigating or remediating the effects and or avoiding potential effects; and	Monitoring programs referenced in this CEMP are derived from the relevant stand-alone management plans. Monitoring reports and adaptive management is considered in those plans.
	i) the scope, content and frequency of reporting on the implementation of altered or new mitigation measures. If there are any requirements or mitigation measures required in the plan, program or other document for which adaptive management, or elements of adaptive management listed in paragraphs d) to l) are assessed to be not appropriate or applicable, the plan must include identification of those requirements and measures, and the rationale for that assessment.	Section 17
Condition 4 (Consultation)	Where a condition of this Certificate requires the Holder consult a particular party or parties regarding the content of a plan, program or other document, the Holder must, to the satisfaction of the EAO: a) provide written notice to each such party that: i) includes a copy of the plan, program or other document; ii) invites the party to provide its views on the content of such plan, program or other document; and iii) indicates: I. if a timeframe for providing such views to the Holder is specified in the relevant condition of this Certificate, that the party may provide such views to the Holder within such time frame; or II. if a timeframe for providing such views to the Holder is not specified in the relevant condition of this Certificate, specifies a reasonable period during which the party may submit such views to the Holder; b) undertake a full and impartial consideration of any views and other information provided by a party in accordance with the timelines specified in a notice given pursuant to paragraph (a); c) provide a written explanation to each such party that provided comments in accordance with a notice given pursuant to paragraph (a) as to: i) how the views and information provided by such party to the Holder have been considered and addressed in a revised version of the plan, program or other document; or ii) why such views and information have not been addressed in a revised version of the plan, program or other document; d) maintain a record of consultation with each such party regarding the plan, program or other document; and e) provide a copy of such consultation record to the EAO, the relevant party, or both, promptly upon the written request of the EAO or such party. The copy of such consultation record must be provided to the EAO, relevant party, or both, no later than 15 days after the Holder receives the request for a copy of the consultation record, unless otherwise authorized by the EAO.	A draft of this CEMP will be provided to Indigenous nations for review and comment. BW Gold will consider comments received and revise the plan accordingly.
Condition 13 (Construction Environmental Management Plan)	The Holder must retain one or more Qualified Professionals to develop a Construction Environmental Management Plan. The plan must be developed in consultation with EMPR, ENV, FOR, and Aboriginal Groups. The plan must include, at a minimum, the means by which the following will be addressed:	
	a) access management;	Section 9.1
	b) invasive plants management;	Section 9.8.2
	c) waste management;	Section 9.3
	d) emergency response;	Section 11
	e) human-wildlife conflict;	Section 9.10

Condition	Condition	Location in Plan
	f) visual resource management;	Section 9.4
	g) erosion and sediment control;	Section 9.2
	h) spill prevention and response for hydrocarbon storage and leaks or other accidental emissions from machinery or equipment;	Section 10
	i) metal leaching (ML) and acid rock drainage (ARD) management;	N/A
	j) geological and terrain hazards; and	Section 9.1
	k) vegetation management.	Section 9.8
	The Holder must provide the draft plan that was developed in consultation with EMPR, ENV, FOR and Aboriginal Groups to the EAO, EMPR, ENV, FOR, and Aboriginal Groups for review a minimum of 90 days prior to the planned commencement of Construction or as listed in the Document Submission Plan required by Condition 10 of this Certificate.	BW Gold to provide the draft plan to EAO, EMLI, ENV, FOR and Indigenous nations for review a minimum of 90 days prior to planned commencement of construction
	The plan and any amendments thereto, must be implemented to the satisfaction of a Qualified Professional throughout Construction and to the satisfaction of the EAO.	Future requirement

Appendix B Concordance Table with Federal Decision Statement Conditions (April 15, 2019)

Table B-1: Federal Environmental Assessment Decision Statement Conditions and Location in Plan

Condition	Requirement	Location in Plan
Condition 2.1 (General Conditions)	The Proponent shall ensure that its actions in meeting the conditions set out in this Decision Statement during all phases of the Designated Project are considered in a careful and precautionary manner, promote sustainable development, are informed by the best information and knowledge available at the time the Proponent takes action (including community and Indigenous traditional knowledge), are based on methods and models that are recognized by standard-setting bodies, are undertaken by qualified individuals, and have applied the best available economically and technically feasible technologies.	Section 4
Condition 2.2 (General Conditions)	The Proponent shall, when mitigation is a requirement of a condition set out in this Decision Statement, give preference to avoiding the adverse environmental effect of the Designated Project over minimizing the adverse environmental effect of the Designated Project. If unable to avoid the adverse environmental effect, the Proponent shall give preference to minimizing the adverse environmental effect of the Designated Project over compensating for the adverse environmental effect of the Designated Project. If unable to minimize the adverse environmental effect, the Proponent shall compensate for the adverse environmental effect of the Designated Project.	Section 9
Condition 2.3 (General Conditions)	The Proponent shall, where consultation is a requirement of a condition set out in this Decision Statement: • 2.3.1 provide a written notice of the opportunity for the party or parties being consulted to present their views and information on the subject of the consultation; • 2.3.2 provide all information available and relevant on the scope and the subject matter of the consultation and a period of time agreed upon with the party or parties being consulted, not less than 15 days, to prepare their views and information; • 2.3.3 undertake a full and impartial consideration of all views and information presented by the party or parties being consulted on the subject matter of the consultation; • 2.3.4 strive to reach consensus with Indigenous nations; and • 2.3.5 advise the party or parties being consulted on how the views and information received have been considered by the Proponent including a rationale for why the views have, or have not, been integrated. The Proponent shall advise the party or parties in a time period that does not exceed the period of time taken in 2.3.2.	Section 16.2.4

Condition	Requirement	Location in Plan
Condition 2.4 (Consultation)	The Proponent shall, where consultation with Indigenous nations is a requirement of a condition set out in this Decision Statement, determine and strive to reach consensus with each Indigenous group regarding the manner by which to satisfy the consultation requirements referred to in condition 2.3, including: • 2.4.1 the methods of notification; • 2.4.2 the type of information and the period of time to be provided when seeking input; • 2.4.3 the process to be used by the Proponent to undertake impartial consideration of all views and information presented on the subject of the consultation; and • 2.4.4. the period of time and the means by which to advise Indigenous nations of how their views and information were considered by the Proponent.	Section 16.2.4

Appendix C Chytridiomycosis Prevention Protocol

Appendix C: Chytridiomycosis Prevention Protocol

Clean equipment by removing foreign material (e.g., mud, vegetation) and sediment. This is best done at the work site or at pre-identified wash areas nearby:

1. Detach parts and accessories to access all surface areas, remove interior seats and mats. Work top to bottom and clean interior last.
2. Physically remove foreign material and sediment, e.g., using shovels and brooms.
3. If needed, power-wash exterior with water pressure ≥ 620 kPa.

Disinfect equipment between work sites using chemicals such as Bleach (6% NaClO) or Vircon (1% KPMS):

1. Check ecological information and ecotoxicity hazards on the Manufacturer's Safety Data Sheet.
2. Apply disinfectant > 50 m away from aquatic habitats.
3. Follow safety guidelines for PPE, concentrations, application method, and contact time.
4. Rinse with water.

Dry equipment for 24 hours if disinfected, or for 5 days if not disinfected.

Appendix D White Nose Syndrome Prevention Protocol

November 6, 2014

Western Canada White Nose Syndrome Transmission Prevention

Contents:

Preventing a giant leap of the P.d. fungus is the most important thing humans can do for western bats.

Background

White Nose Syndrome (WNS) is a devastating disease that is destroying bat populations in North America. The cause of this disease is a cold-loving fungus *called Pseudogymnoascus (formerly Geomyces) destructans (P.d.),* which is expanding its range across North America at an alarming rate. WNS is expected to spread to western North America in the coming years.

Bats are an integral component of the ecosystem; as the primary consumer of night-time insects, bats play an important role in pest control for crops and forests. Bats are long-lived mammals; some species live over 40 years. Bats also have slow reproductive rates; most species have one young per year. Bat populations are vulnerable to WNS because they are unable to quickly bounce back from mass mortality, as has been evidenced in eastern North America.

WNS infected bat in Eastern USA

This document outlines how you can prevent a giant leap of the P.d. fungus to western North America, and minimize the possibility of spreading the fungus within the west if it is already here, or if it arrives in the near future.

Hibernating bats are most at risk to WNS disease. Bats that migrate (e.g. hoary bat) can travel hundreds and even thousands of kilometers, while *hibernating* bats do not tend to travel long distances between summer and winter roosts. There is a significant difference in bat diversity on the east and west side of the Rocky Mountains, suggesting this may be a partial barrier to bat movement. If bat-to-bat transfer remains the mode of spread for this fungus, and humans take precautions to not spread the fungus, the west could remain WNS free for many years. ***Preventing a giant leap of the P.d. fungus is the most important thing humans can do for western bats.***

Bat ecologist counts bats

Delaying the arrival of WNS to western North America also allows researchers more time to study western bats. Very little is known about the winter ecology of many bat species. The west has a richer species diversity of bats than in the east, and it is not known how WNS will impact western specific species. Biologists require time to learn about where western bat species overwinter, what constitutes critical winter habitat, and what is normal winter ecology and behaviour. By determining these details, western bats will benefit; and mitigation techniques can be developed to help reduce the impact of WNS in the west. At a minimum, enough will be learned about winter ecology to facilitate population recovery post-WNS.

WNS Risk Assessment Tool

Use this tool to determine if you are at risk to transmit WNS, and the actions you should take.

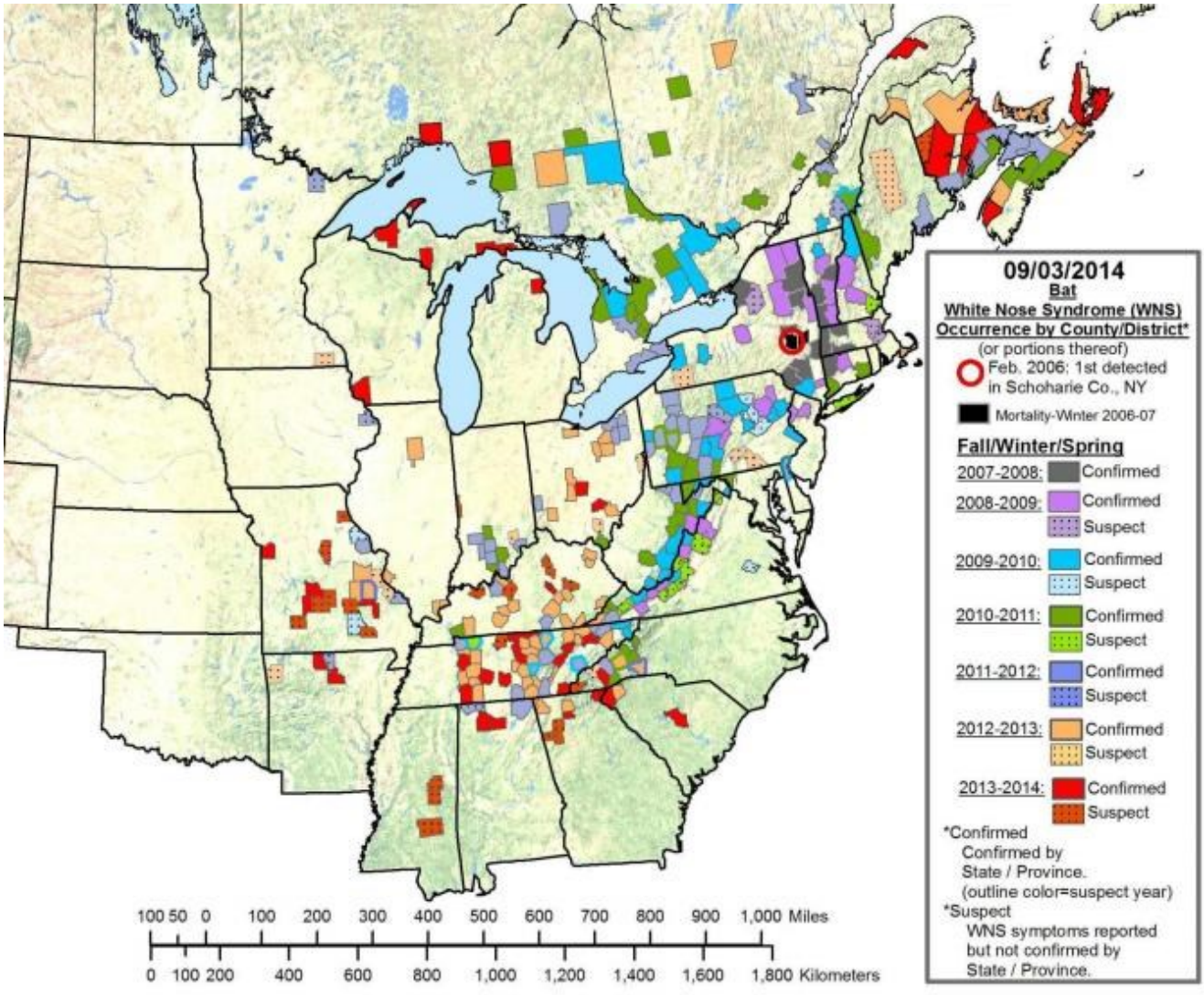
Scenario	Risk Level	Action	Description
You have been underground in western North America where *P.d. is not known to occur; bats or bat signs (e.g. guano, skeletons) were observed in the site.*	**Low**	**Report It** **Clean It**	Report your sightings, your information is critical to research. Thoroughly wash equipment, clothing & body. Ensure you are not bringing soil/ debris to another cave.
You have been underground in western North America where *P.d. is not known to occur; no bats and no bat signs were observed at the site.*	**Low**	**Clean It**	Thoroughly wash equipment, clothing & body. Ensure you are not bringing soil/ debris to another cave.
You have been underground outside of western North America. The area you visited is not known to have P.d. *This includes, but is not limited to: Manitoba, American mid-West, and Mexico*	**Moderate**	**Decontaminate It**	Thoroughly wash equipment, clothing, and body; dispose of materials where possible instead of re-using (eg. soiled gloves), and decontaminate everything that is to be reused underground.
You have been in a cave/mine that has more than 10 recently dead bats evident	**High**	**Report It** **Swap It**	Do not re-use your equipment/ clothing in an underground location in an area that is not known to have *Pd.* **Equipment used in High Risk areas should not go underground in western North America**
You have been in a cave/mine that has bats that show signs of WNS	**High**	**Report It** **Swap It**	
You have been underground in an area known to have Pd. *This includes, but is not limited to: eastern North America, Europe, and Asia*	**High**	**Swap It**	

Purpose

In caves housing WNS-infected bats, spore levels are high and thus the chance of having spores on equipment and clothing is high. The greatest density of spore contamination is likely to occur on anything that enters into a WNS positive cave. Fungal spores are very resistant and are easily spread; risk of infection is extremely high if decontamination is not adequate. **Cavers should not go underground in the West with equipment or clothing that has been used underground in the East because of the high likelihood that this equipment has P.d. spores.**

Cavers want to ensure they are not the vector that spreads this disease. While decontamination techniques have been developed, their effectiveness in all situations on all substrates, is not proven. Decontamination techniques *reduce* the risk of spread of spores, but cannot guarantee it. Cavers must evaluate the level of risk they could transport of spores; the WNS Risk Assessment Tool (page 2) is intended to assist in cavers' choice of equipment and actions.

Because cavers respect their environment and value conservation, compliance with these protocols is expected.



Map by: Lindsey Heffernan, PA Game Commission

Report It

If you see or hear evidence of bats please report your findings. Winter sightings are particularly important to understanding the over-wintering behaviours of western bat species.

Report your bat sightings to:
Wildlife Conservation Society Canada: clausen@wcs.org
BC Bat Action Team: bcbats@gmail.com
Alberta Speleological Society: info@caving.ab.ca

Report any significant number of dead bats and/or signs of WNS (e.g., white muzzle) in western Canada to:
In Alberta: Margo Pybus, Provincial Wildlife Disease Specialist
Email: margo.pybus@gov.ab.ca Phone: 1-877-944-0313 or 780-427-3462
In British Columbia:
Dr. Helen Schwantje, Ministry of Forest, Lands and Natural Resources
Email: Helen.schwantje@gov.bc.ca Phone: 250-953-4285
Dr Purnima Govindarajulu, Ministry of Environment:
Email: Purnima.Govindarajulu@gov.bc.ca Phone: 250 387 9755

Healthy little brown bats

Clean It

Equipment used in caves with a **low risk** of having WNS should be cleaned to reduce the introduction of foreign matter to other caves. Dirt and debris should be cleaned with water. The use of scrubbing tools and pressurized water aid in a more thorough cleaning. Rope should be cleaned with a rope brush to better clean off grit. Pressure washers at car washes are not recommended because of the potential contact of petrochemical products with nylon caving equipment.

Decontaminate It

Equipment used in caves with a **moderate risk** of containing WNS should be decontaminated to eliminate spores that could be on caving equipment.

Reducing spore load can be done in two ways: 1. Removing spores, 2. Inactivating spores (can no longer cause infection). Spores can be removed from surfaces by thorough washing, however, because not all spores can be removed this way, especially from porous substrates such as rope, webbing, and clothing. Potential spores need to be killed/ inactivated. There are two options of decontamination to inactivates spores: A) Submersion in hot water and B) Chemical disinfectant

A) Submersion in Hot Water

The most universally available and preferred option for decontamination of gear is:
Step 1) Clean It following the instructions above. A gentle dish detergent such as Dawn or Camp Soap is encouraged and proven to be more effective in decontamination, but is not required.
Step 2) Submerse gear in water ≥50ºC (122ºF) for 20 minutes. Because fungal spores are resistant, it is crucial the ***50 for 20*** guideline be met. Cooler water or shorter time will compromise the effectiveness of this method. Soaking can be done in a standard washing machine, but may require adjustments to the hot water heater or additional hot water. Testing the effective temperature is required to determine viability.

B) Chemical Disinfectant

Alcohol based disinfectants, such as wipes and hand wash, are not effective for destroying P.d. spores

This option is intended for equipment that cannot be submersed in hot water.
Step 1) Clean dirt and debris off gear using water. The use of scrubbing tools, pressurized water and dish detergent such as Dawn or Camp Soap is encouraged and proven to be more effective in decontamination, but is not required.
Step 2) Disinfect in accordance with label of the chosen product
Disinfectant products must be used in accordance with the label and material safety data sheets (MSDS). Disinfectant products and the contaminated rinse water must be managed and disposed of as per product directions to avoid contamination of groundwater, drinking water, surface water, or any other form of water.
Two chemical treatments are available options include:
1. Household chlorine bleach solution (e.g. Javex) diluted to 10% by volume (1 part bottled bleach solution, 9 parts water).
2. Quaternary ammonium products containing 0.3% ammonium quaternary compounds (quatts). These quaternary ammonium products must be used at the label dilution for best fungicidal activity.
Products currently available in Canada:

- Clorox Disinfecting Wipes (.29 quatts*)
- Lysol Disinfecting wipes (.26 quatts*)
- ASEPTOL 2000 S.E.C. Repro Inc. http://www.secrepro.com/en/sanitary/aseptol_2000.php

Alcohol based disinfectants, such as wipes and hand wash, ***are not*** effective for destroying *P.d.* spores as determined by US FWS.
Note: Some products listed by the U.S. Fish and Wildlife Service (US FWS) decontamination protocol are not available in Canada.
* 0.26 quatt wipes were proven effective in testing by US FWS

Planning for Decontamination:

If you are going to a **moderate risk** cave you will have to decontaminate your gear before and after the trip:

- Choose gear that can be most effectively decontaminated. Rubber boots will be less affected by multiple hot water submersions or chemical treatments than leather boots; and because rubber is not porous, spores will wash away more easily.
- Prepare a strategy for cleaning and treatment of equipment. How and where will all equipment and waste materials be contained, stored, treated or discarded after your trip?
  - Bring bags - Gear should be isolated (quarantined) at the cave/mine entrance, in sealed plastic bags or containers. Be mindful of cross-contamination during quarantine, put your cave suit, boots and equipment into a garbage bag as soon as possible once you exit the cave or return to your vehicle.
  - Be aware of cross contamination. If equipment is not quarantined it can pass spores to camp gear, backpacks, and vehicles. Be prepared to clean and disinfect the outside surfaces of containers and bags prior to putting them in vehicles or storage areas. Do not wear your caving boots in your vehicle.
  - Mud on personal clothing, hair, and skin can also contaminate. On a best effort basis, wash and dry your person and clothing
- Removing mud and sediment before decontamination makes the process more effective (Shelley et al. 2013); efforts should be made to limit muck once you've emerged from the cave, and before equipment is sealed for transport.

….Continued on page 6

Continued from page 5

Gear – Ropes and tackle can be dedicated to a cave, so they do not require frequent decontamination. If this method is chosen, be conscientious of cross contamination during storage. Most ropes and nylon products have not been tested for impact of chemicals; Sterling brand ropes may be soaked in a quaternary ammonium solution for 15 min and rinsed with water. The ***50 for 20*** method is generally preferable due to lack of knowledge of the impact of chemicals on equipment.

Refer to provincial/federal regulatory or land management agencies to determine additional requirements for site visits.

The process of decontamination is about reducing the risk of transferring spores. Anything that is muddy or porous, such as helmet straps, needs to be decontaminated because they could be carrying spores.

Swap It

Under no circumstances should equipment or clothing used in a WNS affected area be used in Western Canada because there is a **high risk** of spore build-up on equipment/clothing in WNS positive caves. The implications of transferring spores are too great and the decontamination is not guaranteed effective.

Cavers who cave outside of western North America can choose from the following options 1) borrow gear while in a WNS area, 2) use old gear and not bring it back or 3) have a set of gear dedicated to use outside of western North America which must be isolated from other gear while in storage to avoid cross contamination.
By swapping gear, cavers greatly reduce the risk of being the vector that causes the giant leap of the P.d. fungus to western North America. When WNS arrives to western Canada the restrictions to cavers will increase and protocols will become more onerous.

It is in the cavers best interest to be diligent in handling and choosing equipment and they must be cognisant of the threat of WNS.

Stay Informed

This is a living document; it will be revised as new research and developments come available. It is recommended you refer to documents online to ensure you are reviewing the most up to date version.

Below are some links for further information on White Nose Syndrome:

White Nose Syndrome.org https://www.**whitenosesyndrome**.org/

White Nose Syndrome Map of North America and each province: http://www.ccwhc.ca/wns_maps.php

BC Bat Conservation fact sheet: http://www.env.gov.bc.ca/wld/documents/wldhealth/WNS_fact_sheet_BC_General_Public_Jan_2014.pdf

Decontamination procedures from US Fish and Wildlife https://www.whitenosesyndrome.org/.../national_wns_revise_final_6.25

Appendix E Archaeological and Cultural Heritage Chance Find Procedure

BW GOLD LTD
a subsidiary company of Artemis Gold Inc

Blackwater Gold Project: Archaeological and Cultural Heritage Chance Find Procedure

APPLICATION

This procedure applies to previously unidentified physical or cultural heritage features or structures, sites, or things of historical, archaeological, paleontological, or architectural significance and provides mitigation measure to avoid or reduce adverse effects.

PROCEDURE

All those responsible for the management, implementation, and operation of any aspect of this procedure will be adequately trained for their role.

Employees and contractors will receive information related to heritage resources previously identified on site as well as cross-cultural training on the history of local Indigenous nations and training on the Chance Find Procedure on their arrival on site through an environmental on-boarding training session and prior to the start of work as part of the Site Orientation. The purpose of this training is to provide site personnel with a basic level of awareness related to heritage, spiritual and archaeological resources and an understanding of their obligations regarding compliance with plan, regulatory requirements, commitments and best practices.

Site supervisors will be provided with a copy of the CSMP and will receive additional training with respect to the Chance Find Procedure.

BW Gold will regularly review and update the training and awareness related to the plan based on changes in training needs and regulatory requirements.

Prior to the commencement of Project work, all workers will:

1. Have received training on the use of this procedure;
2. Have been provided information on typical identifiers for archaeological and cultural use sites;
3. Have reviewed and be aware of the requirements of this procedure;
4. Have reviewed and understood information pertaining to Chance Find Procedures appropriate for the work activity being undertaken.

If in the course of your work you discover what you suspect may be a possible archaeological, historic, cultural, spiritual and/or paleontological site, the following procedures apply:

Upon Discovery

1. Immediately halt work at the location of the discovery, except work required to be undertaken to protect the integrity of the discovery.
2. Delineate an area of at least 50 metres around the discovery as a ‘no work’ zone.
3. Note the location (GPS coordinates) and take photographs.
4. Inform your supervisory, Environmental Manager (EM) or Mine Manager immediately.
5. Prepare an initial Chance Find Form (attached).

Post-Discovery

- Within 24 hours of the discovery, the EM contacts the Project archaeologist and informs Indigenous groups and the Impact Assessment Agency (Table 1 provides key contact information).
- The EM invites Indigenous groups to monitor any work related to the discovery.
- The Project archaeologist conducts an assessment at the location of the discovery subject to BC's Archaeological Impact Assessment Guidelines and protocols that are in place with Indigenous groups respecting the discovery, handling, recognition, recording, transferring and safekeeping of previously unidentified structures, sites or things of historical, archaeological, paleontological or architectural significance and the confidentiality of a discovery.
    - If the discovery is an archaeological site, the Project archaeologist contacts the BC Archaeology Branch. The Project archaeologist, in consultation with the Archaeology Branch, conducts an investigation, and provides updates to the Archaeology Branch and Indigenous groups on the progress of the investigation. The Project Archaeologist works with the EM and Indigenous groups to prepare Site Report, which includes instruction to recommence work in the area. The Site Report is submitted to the EM, Indigenous groups and the Archaeology Branch.
    - If the discovery is a historic site, the Project archaeologist contacts Indigenous groups and local communities to determine site significance.
    - If the discovery is a cultural or spiritual site, the Project archaeologist contacts Indigenous groups to determine site significance.
    - If the discovery is a paleontological site, the Project archaeologist contacts BC's Fossil Management Office.
- Subject to protocols with Indigenous groups, any material discovered on the Project site is stored in a secure location with limited access as follows:
    - If the material is archaeological, the artifact is held by the Project archaeologist until the *Heritage Conservation Act* (HCA) Section 12 permit has expired and the artifact(s) is submitted to the repository designated in the permit.
    - If the material is historical, the repository is determined in consultation with Indigenous nations and local communities.
    - If the material is cultural and/or spiritual, the repository is determined by Indigenous nations.
    - If the material is paleontological, the repository is determined by the Fossil Management Office.
- The handling and storage of material, apart from material outlined in the HCA Section 12 permit, is determined in consultation with Indigenous Nations.

Suspected Human Remains Discovery

If in the course of your work you discover what you suspect may be human remains, the following procedures apply:

- Immediately halt work in the area of the discovery.
- Do not disturb or move the possible human remains.
- Note the location (GPS coordinates) and take photographs.
- Report your discovery to your supervisor, EM or Mine Manager.
- If you are unable to contact a BW Gold representative, and the suspected human remains appear to be current, contact the Vanderhoof RCMP.

The following steps will generally be followed:

- The Coroners Service (Northern Region) in Prince George and Vanderhoof RCMP will be notified and the Coroners Service will determine whether the matter is of contemporary forensic concern.
- If the remains are not of forensic concern, the Archaeology Branch will attempt to facilitate disposition of the remains.
- If a cultural affiliation for the remains can be determined, the Archaeology Branch will contact an organization representing that cultural group. If the remains are of Indigenous ancestry, the Branch will contact the relevant Indigenous communities.
- If remains are buried and under no immediate threat of further disturbance, they will not be excavated or removed. If the remains are partially buried or uncovered, the Archaeology Branch will facilitate disposition.

Table 1: Key Contacts

Name	Email	Phone Number
Archaeology Branch	Archaeology@gov.bc.ca	1 (250) 953-3334
Blackwater Gold	office.blackwater@artemisgoldinc.com	1 (250) 567-3276
Fossil Management Office	Fossil.Management@gov.bc.ca	1 (250) 356-7506
Ulkatcho First Nation	chief@ulkatcho.ca	1 (250) 742-3260
Lhoosk'uz Dené Nation	admin@lhooskuz.com	1 (250) 992-3290
Nadleh Whut'en First Nation	TBC	1 (250) 690-7211
Stellat'en First Nation	TBC	1 (250) 699-8747
Saik'uz First Nation	TBC	1 (250) 567-9293
Nazko First Nation	TBC	1 (250) 992-7982
Skin Tyee Nation	TBC	1 (250) 694-3517
Tŝilhqot'in Nation	TBC	1 (778) 799-2145 or (250) 392-3918
Métis Nation British Columbia	Communications@mnbc.ca	1 (604) 557-5851
Nee-Tahi-Buhn Band	TBC	1 (250) 694-3494
Impact Assessment Agency	iaac.vancouver.aeic@canada.ca	1 (604) 666-2431
BC Coroners Service Northern Region (Prince George)	N/A	1 (888) 991-2111 (toll free) 1 (250) 861 7429
Vanderhoof RCMP	N/A	1 (250) 567-2222
Prince George RCMP	N/A	1 (250) 562-3300

Cultural Heritage Chance Find Report Form

Recorder's Name/Affiliation:_____

Date:_____

Location of chance find (Location description,
UTM coordinates, development, depth below surface):_____

_____

_____

_____

Description of find:_____

_____

_____

Method used to mark and protect find:_____

_____

_____

Distribution:

☐	☐	☐	☐	☐
BW Gold	Site Archaeologist	Indigenous Nations	Archaeology Branch	Fossil Management Office

Sketch Map	Photo

Appendix F Environmental Incident Report Form

Blackwater Gold Project **Environment Incident Report**

Date (YYYY-MM-DD)	
Time:	
Reported By	
Photo Taken (Y/N)	
Location (Name of location)	
UTM East:	
UTM North:	

Incident Description / Extent / Magnitude or Quantity of Material or Area Affected:
(Append maps if required, refer to photos etc)

Incident Response:

Incident Response Actions:

Action (Owner)	Date Completed

Follow-up Tasks:

Action (Owner)	Date Completed

Notification:
(List all individuals to be notified)

Photos and Description:
Photo #1 (Brief Description, Add labels)
Photo #2 (Brief Description)
Photo #3 (Brief Description)

Appendix G Wildlife Incident Report Form

Blackwater Gold Project **Wildlife Incident Report**

Date (YYYY-MM-DD)	
Reported By	
Photo Taken (Y/N)	
Location (Name of location)	
UTM East:	
UTM North:	

Species (BT=bat; CB=caribou; MT=marten; FS=fisher; WV=wolverine; WF=wolf; WT =western toad; GB=grizzly; MO=moose; OT=other)	
Number Observed	
Sex (M=male, F=female, MF=male and female, FF=female and female, U=unknown, UUU = 3 unknown, etc., X=No Data	
Age (A=adult; C=cub; AC=adult and cub; CC=cub and cub; U=unknown; etc. X=No Data	
Condition (H=healthy; P=poor condition; W=wounded; U=Unknown, X= No Data)	
Comments (i.e., unusual observation; health of animal)	

Type of Incident (INT=interaction with field crew; V=vehicle; A= aircraft; MIF=mine infrastructure; M=mortality, X=no Incident)	
Deterrent Used (Y/N)	
Type of Deterrent (H=Heli; V=vehicle; B=bangers; S=screamers; R=rubber bullet; BB=bean bag; N=other noise deterrent, X=no incident)	
# of deterrents used (X=No deterent used)	

Incident Description / Communications / Response

Photos and Description:
Photo #1 (Brief Description)
Photo #2 (Brief Description)
Photo #3 (Brief Description)

Appendix H Paleontological Chance Find Procedure

CHANCE FIND PROTOCOL FOR PALAEONTOLOGICAL RESOURCES IN BRITISH COLUMBIA – BLACKWATER GOLD PROJECT

PREPARED FOR

ERM Consultants Canada Ltd.

1111 West Hastings Street, 15th Floor

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By

Miriam Reichel-Bodner, Senior Project Palaeontologist

LIFEWAYS OF CANADA LIMITED

105, 809 Manning Rd. NE

Calgary, Alberta T2E 7M9

JULY 2022

INTRODUCTION

Palaeontological resources (or fossils) in the Province of British Columbia are protected under the *Land Act* (LA), by the B.C. Fossil Management Office, Heritage Branch (BCHB). According to BCHB "…*all fossils on Crown Land are property of the province and may not be sold or removed from the province. Collecting of fossils is prohibited without a permit*". Therefore, when a developer encounters a fossil during ground disturbing activities, it is required that the finds be reported to the Heritage Branch. Additionally, fossils are qualified under the *Heritage Conservation Act* (HCA) as items having "heritage value" because of their scientific and educational worth. The HCA provides protection and regulation for fossils or fossil sites when they are designated as Provincial Heritage Objects or Sites under the HCA.

Thus, under Section 12.1 of the HCA, a person must not "damage, desecrate or alter a Provincial heritage site or a Provincial heritage object or remove from a Provincial heritage site or Provincial heritage object any heritage object or material that constitutes part of the site or object".

The following guidelines are established, should the Project development activities come across any fossil materials.

PROJECT LOCATION AND RELEVANT GEOLOGIC INFORMATION

The Project is located within the Nechako Plateau, about 160 km southwest of Prince George, BC. Proposed development areas include the mine site and associated infrastructure which include access roads, a landing strip, as well as water and transmission lines. The deposits underlying the Project consist of Quaternary till, volcanic, intrusive, and sedimentary deposits (Ashman Formation) (Figure 1).

FOSSIL POTENTIAL

The Project area with highest potential to yield fossils is the **sedimentary bedrock (Ashman**

Formation) underlying the Final Transmission Line area, specifically between pole markers 515 and 585 (Figure 1). Some macrofossils, including bivalve shells (such as *Myophorella* sp.) (Figure 2) and ammonoids (such as *Dactylioceras kanense*) (Figure 3), as well as occasional gastropod (snail) shells and fish scales have been documented for this area. However, the fragmentary nature of these fossils has deemed them not significant. Even though typically sedimentary rocks hold a medium to high potential for significant fossils, this is not the case for this area due to the presence of conglomerates and a predominance of fragmentary fossil occurrences documented for the area.

Other project areas, especially the ones with underlying volcanic or intrusive rocks, have typically very low potential to yield significant fossil resources. Therefore, the overall potential for significant fossils to be discovered within the Project areas during development activities is low.

However, in the event of a discovery of well-preserved or unique macrofossils, or a dense fossil assemblage by on site personnel during mine development activities, the mitigative measures detailed in this Chance Find Protocol are to be followed.

CHANCE FIND PROTOCOL

If any dense fossil sites (or well-preserved individual fossils) are encountered during development activities, the following steps are to be followed:

1. Inform the site Environmental Manager, who will in turn contact the Project Palaeontologist working on the project OR the B.C. Fossil Management Office, Heritage Branch directly to report the find;

    a. Senior Project Palaeontologist at Lifeways of Canada Limited:

    Dr. Miriam Reichel-Bodner, C: 780-278-6697, E: miriam@lifewaysofcanada.com, www.lifewaysofcanada.com

    b. BC Fossil Management Office: P: (778)-698-4186, E: Fossil.Management@gov.bc.ca, https://forms.gov.bc.ca/industry/report-a-fossil/

2. Photograph the specimen (*in situ*) adding a scale (an object such as a pen or a coin may be used, however a millimetric scale is preferred). Take GPS coordinates of the location, as well as altitude;

3. Include notes about the type of fossil (if known) and depth data if found in an excavation, as opposed to the surface;

4. If it can be determined remotely by a palaeontologist that the fossil may be significant, it is expected that:

    a. Any ground disturbance in the immediate vicinity of the find will be diverted and the fossil(s) will be left in place;

    b. A buffer of 30-50 metres around the find will be established and taped off. Work must be redirected to another area until the following steps are taken;

5. If required, the Project Palaeontologist will collect additional data and will contact the B.C. Fossil Management Office, Heritage Branch or the Royal B.C. Museum;

6. The Project Palaeontologist will develop a mitigation plan in cooperation with the BCHB; and,

7. Work must not resume at that location until approved by the B.C. Fossil Management Office, Heritage Branch.

Note: *This Chance Find Protocol is a preliminary draft, and once the BCHB has reviewed the Addendum to the Palaeontological Report for this project and indicated the required next actions by the proponent, this protocol may be adjusted according to BCHB updated requirements.*

FIGURES

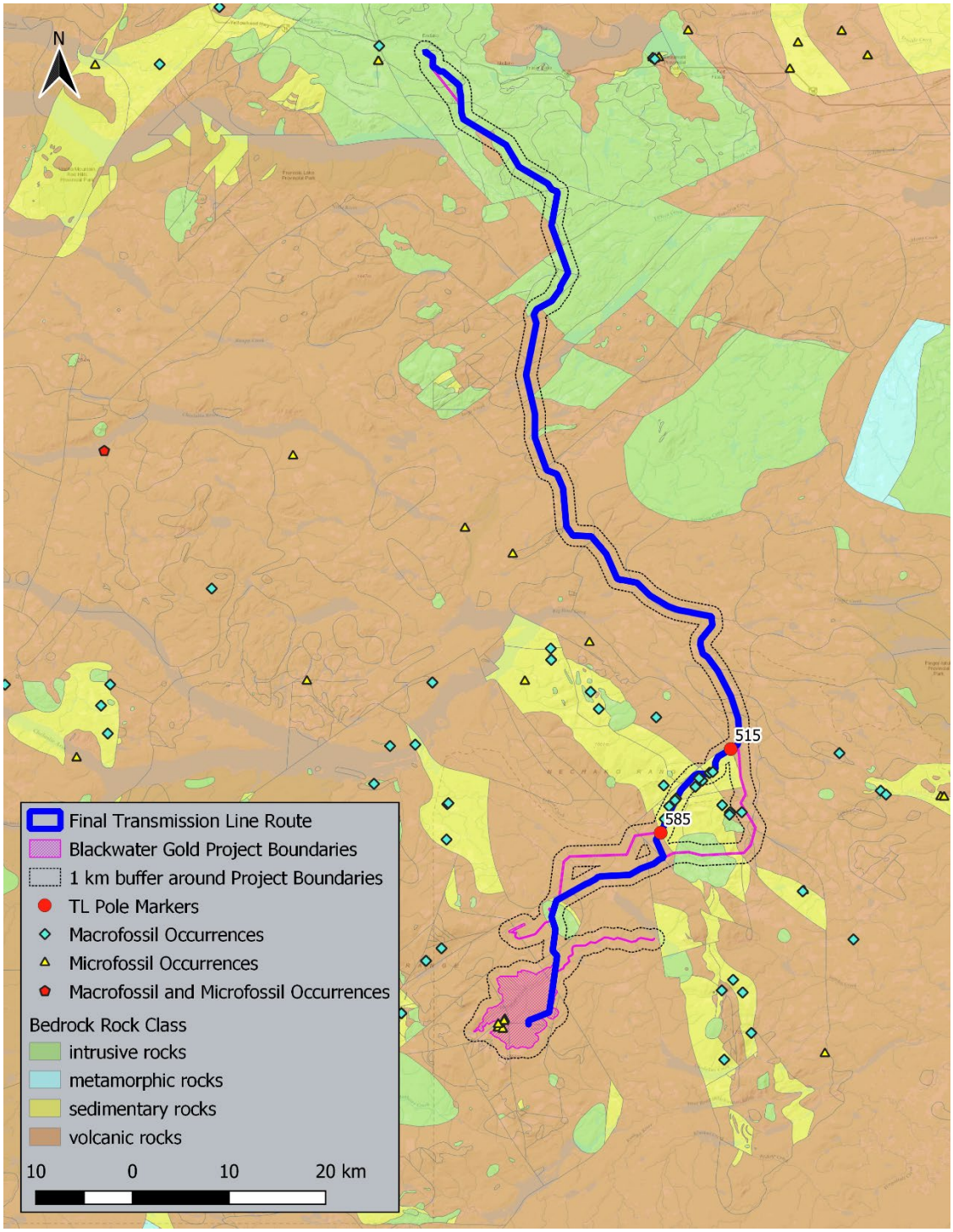

Figure 1. Map of the Project Area, showing rock types known fossil localities, and pole markers at the edge of relevant rocks (based on digital geology map by Cui et al. 2017).

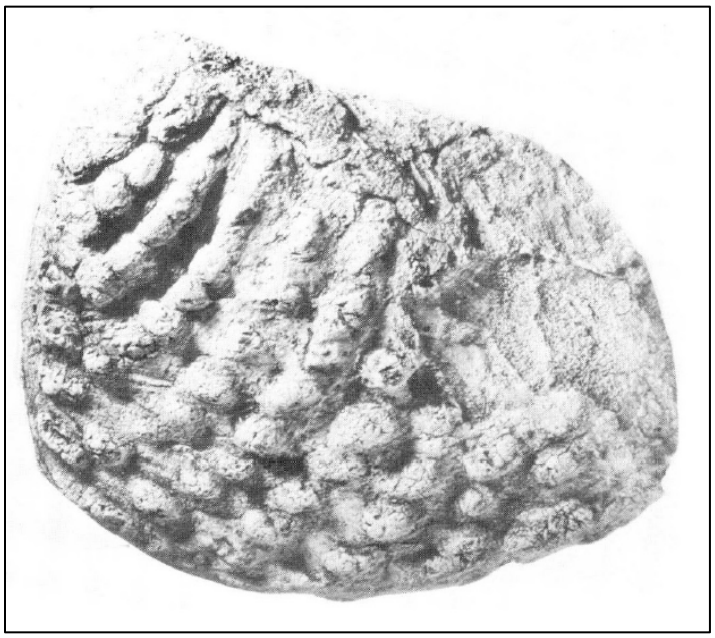

Figure 2. An example of *Myophorella* sp. (modified from Poulton 1977).

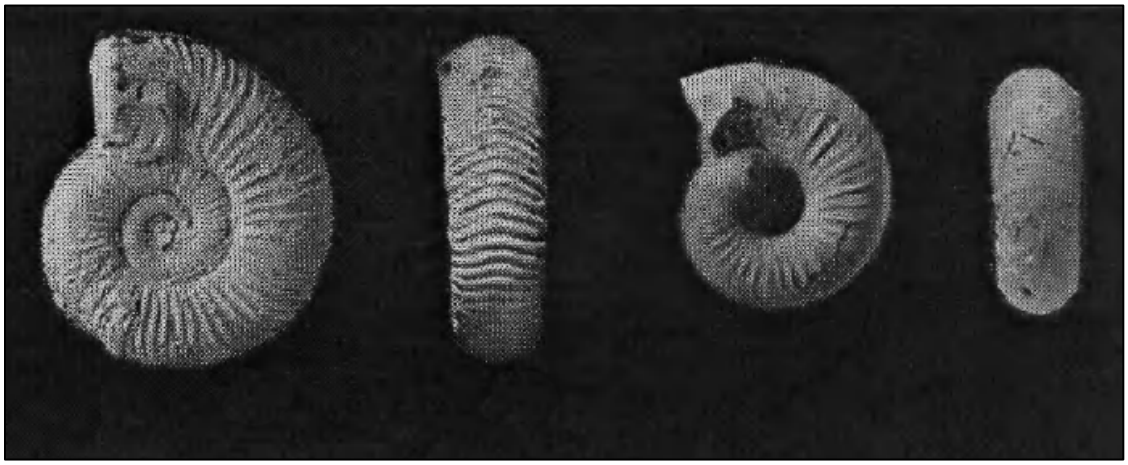

Figure 3. *Dactylioceras kanense* ammonoids (modified from Kutygin and Knyazev 2000).

REFERENCES

Cui, Y., Miller, D., Schiarizza, P., and Diakow, L.J., 2017. British Columbia digital geology. British Columbia Ministry of Energy, Mines and Petroleum Resources, British Columbia Geological Survey Open File 2017-8, 9p. Data version 2019-12-19.

Kutygin, R.V., and Knyazev, V.G. 2000. Ontogeny of the Ammonoid genus *Dactylioceras* from Northeastern Russia. *Paleontological Journal,* **34**: 263-271.

Poulton, T.P. 1977. Early Cretaceous Trigonid Bivalves of Manning Provincial Park, Southwestern British Columbia. *Geological Survey of Canada*, Paper 76-9. 25 pp.

Appendix I Wetlands within the Right-of-Way

Appendix I: Wetlands within the Right-of-Way

Wetland ID	Wetland Class	Listed Status	Start Chainage	End Chainage	Length in RoW (m)	Area in RoW (m^2)	RoW Access Road Crossing?	Vehicle Crossing Type
WT-001	Swamp		1+047	1+115	68	276	No	N/A
WT-002	Swamp		1+115	1+244	129	987	No	N/A
WT-003	Swamp		8+880	9+001	122	5,931	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-005	Bog		12+431	12+482	51	144	No	N/A
WT-006	Swamp		12+450	12+523	73	4,402	No	N/A
WT-006	Swamp		13+022	13+043	21	4,402	No	N/A
WT-007	Swamp		13+168	13+195	27	182	No	N/A
WT-008	Swamp		13+488	13+566	78	3,748	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-009	Swamp		14+083	14+290	206	6,144	No	N/A
WT-009	Swamp		14+397	14+651	254	6,144	No	N/A
WT-010	Swamp		16+858	16+913	55	2,488	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-011	Swamp		25+726	25+819	93	2,382	No	N/A
WT-012	Swamp		27+113	27+169	56	1,331	No	N/A
WT-013	Fen		27+145	27+187	42	536	No	N/A
WT-014	Swamp		35+325	35+429	104	4,863	No	N/A

Wetland ID	Wetland Class	Listed Status	Start Chainage	End Chainage	Length in RoW (m)	Area in RoW (m^2)	RoW Access Road Crossing?	Vehicle Crossing Type
WT-015	Fen		40+782	40+829	47	3,342	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-016	Swamp		41+261	41+288	26	1,365	No	N/A
WT-017	Swamp		42+629	42+701	72	3,586	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-018	Swamp		43+040	43+118	78	3,837	Yes	Ice/shrub crossings or use timber mats, driving mats, or log corduroys
WT-019	Swamp		43+590	43+651	61	3,050	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-020	Swamp		44+999	45+034	35	1,847	No	N/A
WT-021	Swamp		45+757	45+782	25	133	No	N/A
WT-022	Marsh		47+151	47+187	36	342	No	N/A
WT-023	Swamp		47+887	48+123	236	10,716	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-024	Swamp		48+955	49+019	64	3,209	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-025	Fen		49+245	49+265	20	299	No	N/A
WT-026	Swamp		55+359	55+403	44	712	No	N/A
WT-027	Fen		57+564	57+616	51	398	No	N/A

Wetland ID	Wetland Class	Listed Status	Start Chainage	End Chainage	Length in RoW (m)	Area in RoW (m^2)	RoW Access Road Crossing?	Vehicle Crossing Type
WT-028	Fen	Blue	58+513	58+528	15	837	No	N/A
WT-029	Fen	Blue	58+476	58+513	37	1,853	No	N/A
WT-030	Bog		58+933	59+008	75	3,809	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-031	Fen	Blue	60+277	60+323	46	2,098	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-032	Shallow Open Water		60+881	60+929	48	1,034	Yes	Ice/snow crossings, clear span bridge or use timber mats, driving mats, or log corduroys
WT-033	Fen		60+952	60+995	43	2,008	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-034	Fen		61+046	61+144	98	985	No	N/A
WT-035	Fen		61+338	61+361	23	134	No	N/A
WT-036	Swamp		61+740	61+793	53	1,976	No	N/A
WT-037	Swamp		62+587	62+645	58	2,129	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-039	Swamp		66+203	66+369	166	4,211	No	N/A
WT-040	Swamp		66+506	66+578	72	364	No	N/A
WT-041	Bog	Blue	66+584	66+765	181	6,356	No	N/A
WT-042	Swamp		66+537	66+634	98	2,231	No	N/A

Wetland ID	Wetland Class	Listed Status	Start Chainage	End Chainage	Length in RoW (m)	Area in RoW (m^2)	RoW Access Road Crossing?	Vehicle Crossing Type
WT-043	Swamp		67+204	67+246	42	287	No	N/A
WT-044	Swamp		67+160	67+204	43	412	No	N/A
WT-045	Fen		77+373	77+689	316	11,044	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-046	Swamp		77+780	77+854	73	1,679	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-047	Bog		78+972	79+044	72	3,431	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-048	Swamp		79+044	79+094	50	2,571	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-049	Bog	Blue	79+214	79+409	195	12,274	No	N/A
WT-049	Bog	Blue	79+498	79+546	48	12,274	No	N/A
WT-050	Fen	Blue	79+409	79+498	88	4,204	No	N/A
WT-051	Shallow Open Water		79+546	79+667	121	4,280	No	N/A
WT-051	Shallow Open Water		79+702	79+734	31	4,280	No	N/A
WT-052	Swamp		79+667	79+702	35	857	No	N/A
WT-053	Swamp		80+579	80+725	146	7,508	No	N/A
WT-054	Swamp		82+859	82+887	28	1,494	No	N/A

Wetland ID	Wetland Class	Listed Status	Start Chainage	End Chainage	Length in RoW (m)	Area in RoW (m^2)	RoW Access Road Crossing?	Vehicle Crossing Type
WT-055	Swamp		87+081	87+148	67	3,349	No	N/A
WT-056	Fen		88+421	88+538	116	5,646	No	N/A
WT-057	Swamp		89+497	89+545	49	1,326	No	N/A
WT-058	Swamp		91+821	91+859	38	2,132	No	N/A
WT-059	Swamp		92+883	92+919	36	1,848	No	N/A
WT-061	Bog		94+575	94+647	72	1,882	No	N/A
WT-062	Fen		105+263	105+317	54	2,001	No	N/A
WT-063	Swamp		105+604	105+650	46	2,310	No	N/A
WT-065	Fen		106+770	106+828	59	1,793	No	N/A
WT-066	Swamp		110+355	110+413	58	1,429	No	N/A
WT-067	Swamp		114+525	114+659	133	3,252	No	N/A
WT-068	Swamp		114+945	115+122	177	7,005	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-069	Swamp		115+169	115+245	76	3,811	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-070	Swamp		115+296	115+351	55	493	No	N/A
WT-071	Fen	Blue	115+122	115+169	47	5,761	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-071	Fen	Blue	115+245	115+325	80	5,761	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys

Wetland ID	Wetland Class	Listed Status	Start Chainage	End Chainage	Length in RoW (m)	Area in RoW (m^2)	RoW Access Road Crossing?	Vehicle Crossing Type
WT-072	Swamp		115+325	115+585	260	9,402	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-074	Swamp		115+442	115+965	522	18,038	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-075	Swamp		115+685	115+780	95	4,346	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-076	Swamp		120+687	120+728	41	1,921	No	N/A
WT-077	Bog		125+183	125+223	40	448	No	N/A
WT-078	Swamp		125+372	125+637	265	9,376	Yes	Ice/snow crossings or use timber mats, driving mats, or log corduroys
WT-079	Swamp		126+056	126+119	63	446	No	N/A

Appendix K Transmission Line Surface Erosion Prevention and Sediment Control

ARTEMIS GOLD INC | Blackwater Mine

Transmission Line Surface Erosion Prevention and Sediment Control Plan

Table of Contents

List of Tables

Work Instructions

Transmission Line Surface Erosion Prevention and Sediment Control Plan

Version	H.1
Replaces	G.1
Creation Date	09/04/2023
Scheduled Review Date	
Review Date	
Document Team Members	
Document Owner:	
Document Approver:	
Related Documents:	
Key Contacts:	
Change Requests:	

Acronyms and Abbreviations

Artemis	Artemis Gold Inc.
BC	British Columbia
BC CDC	British Columbia Conservation Data Centre
BMPs	Best Management Practices
Blackwater	Blackwater Gold Project
BW Gold	BW Gold Ltd.
CCN	Cheslatta Carrier Nation
CM	BW Gold Construction Manager
CCM	EPC Construction Manager
CEO	Chief Executive Officer
DFO	Department of Fisheries and Oceans
DS	Decision Statement
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
ECCC	Environment and Climate Change Canada
EM	BW Gold Environmental Manager
ELoMC	Environmental Life of Mine Monitoring Committee
EMLI	Ministry of Energy, Mines and Low Innovation Carbon
EMP	Environmental Management Plan
EMS	Environmental Management System
EPC	Engineering, Procurement and Construction
ESC	erosion and sediment control
FOR	Ministry of Forests
JAIR or Joint MA/EMA Application	Joint Application Information Requirements for *Mines Act and Environmental Management Act* Permits
km	kilometres
MEMPR	Ministry of Energy, Mines and Petroleum Resources
MOE	Ministry of Environment
NFN	Nazko First Nation
NWFN	Nadleh Whut'en First Nation
Project	Blackwater Gold Project
QP	Qualified Professional
RISC/RIC	Resources Information Standards Committee/Resource Inventory Committee Standards

RMA	Riparian Management Area
RMZ	Riparian Management Zone
RoW	Right of Way
RRZ	Riparian Reserve Zone
SFN	Saik'uz First Nation
SOP	Standard Operating Procedure
StFN	Stellat'en First Nation
TEM	Terrestrial Ecosystem Mapping
TL	Transmission Line
TL IPD	Transmission Line Initial Project Description
TL IVMP	Transmission Line Integrated Vegetation Management Plan
TL SEPSCP	Transmission Line Surface Erosion Prevention and Sediment Control Plan
UFN	Ulkatcho First Nation
VP	Vice President
NTUs	Nephelometric turbidity units
PMP	Probable Maximum Precipitation
TARP	Trigger Action Response Plan
TSS	total suspended solids
YDU-WL	Yinka Dene 'Uza'hne – Water Law

1.0 Project Overview

The Blackwater Gold Project (the Project) is a gold and silver open pit mine located in central British Columbia (BC), approximately 112 kilometres (km) southwest of Vanderhoof, 160 km southwest of Prince George, and 446 km northeast of Vancouver. The Project site is presently accessed via the Kluskus Forest Service Road (FSR), the Kluskus-Ootsa FSR and an exploration access road, which connects to the Kluskus-Ootsa FSR at km 142. Electrical power for the Project will be supplied by a new approximately 135 km and up to 140 m wide corridor, 230 kilovolt overland transmission line (TL) that will connect to the BC Hydro grid at the Glenannan substation located near the Endako mine, 65 km west of Vanderhoof. A brief description of the proposed TL is as follows:

- From the Glenannan substation to the mine site permit area, the TL will be permitted by way of Licence of Occupation (LOO);
- The TL will be constructed within a cleared right-of-way (RoW) of 40 metre (m) width for standard spans, but up to 50 m width for longer spans in select areas. The TL RoW area is approximately 541 ha for the entire length of 135 km;
- Existing permitted and non-status roads will be used for the purpose of accessing the RoW. New access trails and stream crossings will be located only within the TL cleared RoW;
- Equipment and material laydown areas will also lie within the cleared RoW; and
- The construction workforce will be housed at the Project camp or other independent commercial accommodations in the area.

Overall Project construction is anticipated to take two years. The TL is anticipated to take approximately 14 months to construct. Post-construction, most of the temporary access trails used for construction on the TL RoW will be deactivated and/or decommissioned within 3 years except for of those required for maintenance. During operation of the TL there will be periodic inspections and maintenance as well as occasional unscheduled power supply interruptions that will require inspection and maintenance/repair activities.

Once commissioned, the TL will support mine development, through operations and mine closure. The mine site is located within the traditional territories of Lhoosk'uz Dené Nation (LDN), Ulkatcho First Nation (UFN), Skin Tyee Nation and Tsilhqot'in Nation. The Kluskus and Kluskus-Ootsa Forest Service Roads (FSRs) and Project TL crosses the Traditional Territories of Nadleh Whut'en First Nation (NWFN), Saik'uz First Nation (SFN), and Stellat'en First Nation (StFN; collectively, the Carrier Sekani First Nations) as well as the Traditional Territories of the Nazko First Nation (NFN), Nee Tahi Buhn Band, Cheslatta Carrier Nation, and Yekooche First Nation (EAO 2019a and 2019b).

Additional details on the TL components and activities are presented in Section 3.2 of the Transmission Line Initial Project Description (TL IPD; BW Gold 2022).

2.0 Purpose and Objectives

The purpose of the Transmission Line Surface Erosion Prevention and Sediment Control Plan (TL SEPSCP) is to minimize the potential for mobilizing sediment, destabilizing slopes, and impacting surface water quality and aquatic habitat resulting from mining activities during construction and operations phases of the transmission line (TL). The TL SEPSCP supports applications for Crown land tenure (i.e., Statutory RoW, LOO) under the *Land Act* and is also required under the *Forest and Range Practices Act* (FRPA) This plan

outlines key roles, as well as provides guidance on assessing erosion potential, and developing prescriptions for event-based control strategies.

The objectives of the TL SEPSCP are to:

- Minimize the potential for mobilizing sediment, destabilizing slopes; and
- Ensure surface water quality and aquatic habitat remains uncompromised.

This TL SEPSCP is intended to be used in conjunction with other management and monitoring plans pertinent to the protection of the aquatic receiving environment, including the following:

- Transmission Line Sediment Monitoring Plan (as required by Condition 29 of the EAC);
- TL Construction Environmental Management Plan; and
- TL Air Quality and Fugitive Dust Management Plan.

The intent of this document is to outline strategies and design objectives, with appropriate flexibility, to allow the facilities to be field fit to suit the site conditions encountered (i.e., an adaptive management approach). The TL SEPSCP describes best management practices (BMPs) that will be implemented – it is not meant to be prescriptive. Site specific measures to be implemented for specific work areas (e.g., stream crossings) will be presented on detailed design drawings prepared for construction. The overall objective of the TL SEPSCP is to manage contact water within the TL RoW and roads, so as to prevent runoff from potentially impacting adjacent watercourses.

The term “contact water” in relation to TL construction activities is used to describe water that has come into contact with any disturbed areas, road runoff, borrow areas, or vegetation cleared areas. Conversely, “non-contact water” is used to describe water that has not come into contact with any disturbed areas.

The TL SEPSCP is focused mainly on the construction phase of the TL which is estimated to be approximately 14 months in duration once permits are received. The construction phase of the project is the period of highest risk for erosion and sedimentation effects. Subsequent to construction the TL will receive much lower levels of disturbance with the consequent reduction in environmental risk due to sediment releases.

3.0 Roles and Responsibilities

BW Gold has an obligation to meet previous commitments and delegate responsibilities associated with those commitments to mine personnel and site contractors during all phases of the mine life. A clear understanding of the roles, responsibilities, and level of authority that employees and contractors have when working at offsite infrastructure such as the Transmission Line as addressed by this plan, is essential to meet EMS objectives.

Table 3-1 provides an overview of general environmental management responsibilities during all phases of the mine life for key positions that will be involved in environmental management. Other positions not specifically listed in Table 3-1 that will provide supporting roles include independent environmental monitors, other qualified persons, and qualified professionals (QPs).

Table 3-1: Blackwater Roles and Responsibilities

Position	Responsibility
Chief Executive Officer (CEO)	The CEO is responsible for overall Project governance. Reports to the Board.
Chief Operating Officer (COO)	The COO is responsible for engineering and Project development and coordinates with the Mine Manager to ensure overall Project objectives are being managed. Reports to the CEO.
Vice President (VP) Environment & Social Responsibility	The VP is responsible for championing the Environmental Policy Statement and Environmental Management System (EMS), establishing environmental performance targets, and overseeing permitting. Reports to the COO.
General Manager (GM) – Development	The GM is responsible for managing project permitting, the Project's administration services and external entities, and delivering systems and programs that ensure Artemis's values are embraced and supported: Putting People First, Outstanding Corporate Citizenship, High Performance Culture, Rigorous Project Management and Financial Discipline. Reports to COO.
Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, EMS implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the GM.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments and obligations are being met during the construction phase. Reports to the GM.
Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement and Construction (EPC) contractor, other contractors, the Company, and regulatory agencies, where required. Supports the CM and reports to the Mine Manager.
Departmental Managers	Departmental Managers are responsible for implementation of the EMS relevant to their areas. Report to the Mine Manager.
Indigenous Relations Manager	Indigenous Relations Manager is responsible for Indigenous engagement throughout the life of mine. Also responsible for day-to-day management and communications with Indigenous groups. Reports to the EM.
Community Relations Advisor	Community Relations Advisor is responsible for managing the Community Liaison Committee and Community Feedback Mechanism. Reports to the Mine Manager.
Environmental Monitors	Environmental Monitors (includes Environmental Specialists and Technicians) are responsible for tracking and reporting on environmental permit obligations through field-based monitoring programs. Report to the EM.

Position	Responsibility
Aboriginal Group Monitors	Aboriginal Group Monitors are required by EAC #M19-01 Condition 17 and will be responsible for monitoring the Project's potential effects on Indigenous interests. Aboriginal Group Monitors will be involved in adaptive management and follow-up monitoring programs. Report to the EM.
Employees and Contractors	Employees are responsible for being aware of permit requirements specific to their roles and responsibilities. Report to the Departmental Managers.
Qualified Professionals and Qualified Persons	Qualified professionals and qualified persons will be retained to review objectives and conduct various aspects of environmental and social monitoring as specified in Environmental and Social Management Plans.

BW Gold will employ a qualified person as Environmental Manager (EM) who will ensure that throughout the TL Construction phase, the EMS requirements are established, implemented, and maintained, and that environmental performance is reported to management for review and action. The EM is responsible for retaining the services of qualified persons or QPs with specific scientific or engineering expertise to provide direction and management advice in their areas of specialization. The EM will be supported by a staff of Environmental Monitors that will include Environmental Specialists and Technicians and a consulting team of subject matter experts in the fields of environmental science and engineering. In accordance with EAC Condition 29 a), the development and implementation of sediment and erosion control prescriptions for all transmission line construction and maintenance works must be prepared by a Qualified Professional who is also a Certified Professional in Erosion and Sediment Control (CPESC).

During the TL construction, the EPC contractor, and subcontractors, will report to the CM. The EPC contractor will be responsible for ensuring that impacts are minimized, and environmental obligations are met during the Construction phase. For non-EPC contractors, who will perform some of the minor works on site, the same reporting structure, requirements, and responsibilities will be established as outlined above. BW Gold will maintain overall responsibility for management of the construction and operation phase of the TL and will therefore be responsible for establishing employment and contract agreements, communicating environmental requirements, and conducting periodic reviews of performance against stated requirements.

The CM is accountable for ensuring that environmental and regulatory commitments/obligations are being met during the construction phase. The EM will be responsible for ensuring that construction activities are proceeding in accordance with the objectives of the EMS and associated management plans. The EM or designate will be responsible for reporting non-compliance to the CM, EPC contractor, other contractors, the Company, and regulatory agencies, where required. The EM or designate will have the authority to stop any construction activity that is deemed to pose a risk to the environment; and work will only proceed when the identified risk has been addressed and concerns rectified.

Environmental management during operation of the Project will be integrated under the direction of the EM, who will liaise closely with Departmental Managers and will report directly to the Mine Manager. The EM will be supported by the VP of Environment and Social Responsibility in order to provide an effective and integrated approach to environmental management and ensure adherence to corporate environmental standards. The EM will be accountable for implementing the approved management plans and reviewing them periodically for effectiveness. Departmental Managers (e.g., mining, milling, and plant/site services) will be directly responsible for implementation of the EMS and management plans/standard operating procedures relevant to their areas. It is expected that during operations of the project that the operations, inspection, and maintenance/repair of the TL will fall under the Mine Site Services Department, with some of the services being assigned to qualified consultants and contractors.

All employees and contractors are responsible for daily implementation of the practices and policies contained in the EMS.

During closure and post-closure, staffing levels will be reduced to align with the level of activity associated with these phases. Prior to initiating closure activities, BW Gold will revisit environmental and health and safety roles and responsibilities to ensure the site is adequately resourced to meet permit monitoring and reporting requirements. The Mine Manager will have overall responsibility for Closure and Post-closure activities.

Pursuant to Condition 19 of the EAC #M19-01, BW Gold has established an Environmental Life of Mine Monitoring Committee (EloMC) to facilitate information sharing and provide advice on the development and operation of the Project, and the implementation of EAC conditions, in a coordinated and collaborative manner. Committee members include representatives of the Environmental Assessment Office (EAO), UFN, LDN, NWFN, StFN, SFN, NFN, Ministry of Energy, Mines and Low Carbon Innovation (EMLI), Ministry of Environment and Climate Change Strategy (ENV) and Ministry of Forests.

Pursuant to Condition 17 of the EAC #M19-01, Aboriginal Group Monitor and Monitoring Plan, BW Gold will retain or provide funding to retain a monitor for each Indigenous nation defined in the EAC #M19-01 prior to commencing construction of the transmission line and during the transmission line's active maintenance activities and decommissioning. The general scope of the monitor's activities will be related to monitoring for potential effects from the TL on the Indigenous nations' interests.

The TL EPC contractor roles and responsibilities relating to environmental management, industrial and domestic waste management, and environmental protection are identified below in Table 3-2.

Table 3-2: Transmission Line Construction Contractor Roles and Responsibilities

Role	Responsibility
Contractor Construction Manager (CCM)	The Contractor Construction Manager (CCM) has ultimate responsibility for construction proceedings, including worker and public health and safety and environmental protection. The CCM will ensure the implementation of training programs as well as support the Blackwater Gold Environmental Policy. The CCM will ensure that adequate support and resources are made available for the implementation and maintenance of the Environmental Management System, including the management plan implementation and review. The CCM may, as needed, delegate their duties to Qualified Professional. Reports to the BW Gold Construction Manager
Contractor Construction Superintendents	The Contractor Construction Superintendents have an administrative responsibility and requirement to act upon the directions, guidance, and support of the Construction Manager. They are resources to the CCM, and have the following responsibilities: • Support the implementation of the Blackwater Gold Environmental Policy; • Ensure that environmental matters are given consideration in pre-planning of construction activities, budgets, training, and operations; and • Ensure that workers under their supervision are made aware of known, or reasonably foreseeable, environmental aspects where they work.

Role	Responsibility
Construction Employees, Contractors, and Sub-Contractors	Employees have general responsibilities for environmental protection, which include: • Supporting the Blackwater Gold Environmental Policy; • Supporting implementation of Environmental Management Plans; • Cooperating with the Blackwater Environmental Montioring Committee representative(s); • Learning and following environmental best practices and procedures relevant to their work; • Following instructions and directives given by supervisors; • Operating equipment in an environmentally responsible manner to avoid environmental impacts; • If training another worker, ensuring that they are properly completing all required tasks and responsibilities in accordance with environmental best practices and procedures; • Reporting all environmental incidents immediately to their supervisor, who will expedite a response to address the incident; • Participating in mitigating or minimizing harm to the environment should an environmental incident occur; and • Asking for help or information when unsure how to perform a task without compromising social, cultural, archaeological, or environmental values.

4.0 Compliance Obligations, Guidelines, and Best Management Practices

4.1 Legislation

Federal legislation pertinent to water management includes:

- *Canadian Environmental Protection Act, 1999;*
- *Fisheries Act;*
- *Impact Assessment Act;*
- *Migratory Birds Convention Act;*
- *Species at Risk Act;*
- Federal Policy on Wetland Conservation;
- *United Nations Declaration on the Rights of Indigenous Peoples Act.*

Provincial legislation pertinent to water management includes:

- *BC Environmental Management Act;*
- *Environmental Assessment Act;*
- *Environmental Management Act;*
- *Mines Act* -Health, Safety and Reclamation Code for Mines in BC;
- Forest Practices Code of British Columbia;
- *Water Sustainability Act*.; and
- *Wildlife Act*.

4.2 Environmental Assessment Certificate and Decision Statement Conditions

EAC Condition 13, which has been approved, requires the development of a Construction Environmental Management Plan (CEMP) which must address erosion and sediment control. The TL SEPSCP, herein, forms an important component of the Transmission Line CEMP as it relates to the development and implementation of ESC measures.

Similarly, Condition 29 of the EAC, which is being submitted, requires the development of a Transmission Line Sedimentation Monitoring Plan that takes into consideration the development and implementation of steps and procedures that are to be followed during the construction, operations, and closure of the Transmission Line. To address Condition 29, a separate but related document, entitled *Transmission Line Sedimentation Monitoring Plan – Framework and Guidelines* (TL SMP-FG) was prepared by Ecologic Environmental Consultants Ltd. (EcoLogic 2022). Throughout this TL SEPSCP, references are made to the TL SMP-FG. The TL SEPSCP and the SMP-FG are related and non-conflicting documents that support each other in the successful implementation of Condition 29. Section 3.4 of EcoLogic (2022) provides the draft guidelines and framework for Environmental Compliance Requirements.

Reference is made to ESC in Condition 3.1 in federal DS which states:

> *"The Proponent shall implement measures to control erosion and sedimentation within the Designated Project area to avoid the deposit of deleterious substances in water frequented by fish. The Proponent shall submit these measures to the Agency and to Indigenous groups before implementing them."*

Section 6 of the SEPSCP addresses this federal DS condition.

4.3 Guidelines and Best Management Practices

Best management practice (BMP) guidelines, industry standards, and other documents used to develop this document include, but are not limited to:

- Developing a Mining Erosion and Sediment Control Plan (BC MOE 2015);
- Health, Safety, and Reclamation Code for Mines in British Columbia (BC MEM 2022);
- BC Field Sampling Manual (BC MOE 2013);
- Standards and Best Practices for Instream Works (BC WLAP 2004);
- Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al. 1993); Manual of Control of Erosion and Shallow Slope Movement (Coulter et al. 1997);
- Freshwater Intake End-of-Pipe Fish Screen Guideline (DFO 1995);
- Erosion and Sediment Control Practices for Forest Roads and Stream Crossings a Practical Operations Guide (Gillis 2007);
- Natural Processes: The Application of Natural Systems for the Reclamation of Drastically Disturbed Sites (Polster 2009);
- Erosion and Sediment Control (VOI 2005);
- Alberta Transportation (AT) - Erosion and Sediment Control Manual (AT 2011);
- Forest Practices Codes Fish Stream Crossing Guide (BC MFLNRO, BC MOE and DFO 2012); and
- Field Guide to Noxious and Other Selected Invasive Plants of British Columbia (Ralph et al. 2014).

The reader is also referred to EcoLogic (2022) Section 3.7 Best Management Practices for additional considerations (e.g., Engineering with Nature).

5.0 Support

5.1 Training and Education

All staff will attend site orientation where the contents, requirements and commitments made in this plan will be communicated. Staff will be adequately trained for their roles to implement this plan and will be aware of BW Gold's commitments to uphold this plan. Training will cover measures to mitigate effects on ecosystems, soils, vegetation, and aquatic systems, and will emphasize the importance of following and implementing the TL SEPSCP. The project QP-CPESC for ESC will be responsible for reviewing the training program to ensure that it meets or exceeds requirements.

Employee education and outreach on surface erosion prevention and sediment control will be supported by:

- Development and delivery of educational material to site personnel; and
- Maintaining updated information related to surface erosion prevention and sediment control at Blackwater in a location available to employees.

5.2 Internal and External Communication

Observations related to surface erosion prevention and sediment control will be:

- Reported by construction staff to their supervisors;
- Documented in an Observation Logbook to be kept and maintained by the site QP-CPESC for ESC on behalf of the Contract Construction Manager;
- Reported to the Independent Environmental Monitor prior to site visits and documented inspections; and
- Reported at least monthly by the Contract Construction Manger to the BW Gold EM on the content of the Observation Logbook. More frequent reporting may be required at the request of the BW Gold EM.

Refer to EcoLogic (2022) Section 3.9 Reporting Requirements which provides additional communication requirements.

6.0 Implementation Measures

6.1 General Approach

The TL SEPSCP, herein, is focused on the use of source control measures to prevent sediment from getting entrained in surface water runoff, and the use of erosion and sediment control (ESC) measures to manage surface water affected by construction activities. In addition, ESC measures, where required, have been designated downgradient of construction grading activities.

The ESC measures outlined in Table 6.1-1 have been selected for general application during construction of the major components of the TL construction. Selected mitigation measures may be applied individually or combined to arrive at the required level of ESC. For higher risk and higher consequence works, a multi-barrier approach may be utilized, in which a combination of ESC measures is installed in series to reduce potential for sediment transport. Adaptive selection in the field will be dependent on observed site conditions, schedule, and weather.

Table 6.1-1: Work Activity, Potential Erosion Hazard and Associated ESC Measures

Type of Work	Potential Hazard	ESC Measures (Best Management Practices)
Site Preparation (vegetation clearing and grubbing)	• Disturbance of vegetation	• Disturbed areas will be re-seeded and/or re-vegetated as soon as possible with approved species as prescribed
Disturbed soils (grading, cut and fill, digging, boring, accessing construction site)	• Splash, sheet, rill and wind erosion, and sediment transport off-site	• Limit size of disturbed area. • Minimize time of exposure of disturbed soils. • Runoff to be directed away from exposed soil surfaces, when practical. • Areas of exposed soil will be covered and re-vegetated as soon as possible following construction or before winter shut down in preparation for freshet. • Isolate areas of disturbance using coir log or silt fence when needed to prevent sediment laden waters from entering watercourse. • Install downgradient sediment traps to capture runoff and allow settling. • Work will stop or be redirected to accommodate heavy rainfall event when the site shows signs of deterioration. • ESC measures will be inspected regularly and checked after rain/wind events and repaired as required. The structures will be cleaned out when sediment has accumulated.
Ditch Construction	• Rill and gully erosion, and sediment transport off-site	• Construct any ditches, water bars, or water diversions within the work area so they do not directly discharge sediment-laden surface flows into the stream. Divert such flows to a vegetated area where flows can slowly infiltrate.

The project QP-CPESC for ESC will be responsible for overseeing the contractor's implementation of the ESC measures and commitments, which includes supervision, monitoring, reporting, orientation, education, and training. The project QP-CPESC holds the primary responsibility for the types of ESC measures being implemented, for verification of satisfactory completion, and regular reporting to the Independent Environmental Monitor (IEM). The IEM will also conduct scheduled inspections that will be integrated into the ESC program.

BW Gold will invite the Aboriginal Groups' monitors and, if available, arrange for the Aboriginal Groups' monitors to be present during TL construction and maintenance activities where site-specific ESC measures and prescriptions are being planned and implemented. The TL SEPSCP and related TL SMP-FG and revisions must be implemented to the satisfaction of the site QP-CPESC for ESC throughout the TL construction and maintenance activities, and to the satisfaction of the EAO and EMLI.

Table 6.1-2 provides products and methodologies to be employed when construction work activities require ESC.

Table 6.1-2: Erosion and Sediment Control Product and Methodology List

Product	Components	General Description	Potential Uses
Silt Fence	Woven Geotextile / stakes	Preassembled woven geotextile mounted to 4-foot stakes.	Toe of slope stockpiles or berms containing exposed soils. Downgradient of exposed soil on slopes where rainfall could entrain and transport sediment.
Rock Check Dams	75-300 mm diameter, clean pit run rock	Non-woven geotextile required for core.	Installed in drainage ditches to slow velocity of water and allow entrained sediment to settle upstream of the check dam.
Triangular Silt Control Dyke	Bought pre-fabricated	Triangular foam wrapped in geotextile filter fabric. Typically sold in 7’ lengths.	Same purpose as a rock check dam but requires less equipment for placement. Requires more maintenance than rock check dams.
Coir Logs	30 cm diameter 20 cm diameter	Log manufactured from coconut fibres which is staked into the ground.	Same purpose as a silt fence. Requires embedment to minimize ground disturbance. Larger diameter logs should be used to protect ecologically sensitive areas, or to provide basic filtration of water draining from larger areas of exposed soil.
Rock Filter Bags	Bags of rock	Filter bags filled with clean 50 mm rock.	May be used as a barrier, to secure silt fence and geotextile.
Seed	Approved seed mix	Seed areas once disturbance is complete to reduce potential for future erosion.	Exposed soil at final grade, or where area will be left for longer than 30 days.
	As specified in design drawings, construction specifications or Conceptual Reclamation Plan	Permanent seed to be applied once areas are to final grade.	Areas in which construction has been completed should be seeded with a permanent native seed mix. The proposed seed mix (or similarly commercially available) will be comprised of the following species or equivalent: • Slender wheatgrass (*Elymus trachycaulus*); • Rocky mountain fescue (*Festuca saximontana*); • Tufted hairgrass (*Deschampsia caespitosa*); and • Northern sweetvetch (*Hedysarum boreale*).

Product	Components	General Description	Potential Uses
			The purpose of temporary seeding is to stabilize the soil and reduce damage from wind and/or water until permanent stabilization is accomplished. Seeding is applicable to areas that are exposed and subject to erosion for more than 30 days, and is usually accompanied by surface preparation, fertilizer, and mulch; however, the timing of seeding is weather and season dependent and consequently this method is not applicable at all times. Temporary seeding may be accomplished by hand or mechanical methods, or by hydraulic application (hydroseeding), which incorporates seed, water, fertilizer, and mulch into a homogeneous mixture (slurry) that is sprayed onto the soil. Selection of seeding methods will be site-specific: hand seeding will be used in small areas that are difficult to reach with equipment and hydroseeding will be used on steep slopes (>2:1) that are highly susceptible to erosion. Fertilizers and hydroseeding containing fertilizers will not be used near watercourses (within 30 m of the top of bank).
Erosion Control Blanket	Rolled erosion control blanket (Coir or Straw)	Erosion control blanket made of either coir or straw materials and provided in a roll which can be rolled out to cover exposed soil.	Slopes can be stabilized with erosion control blanket to minimize erosion. Also used in channels which will be exposed to water flow before vegetation establishment.
Riprap	Class 1 and 2 Riprap	As per Technical Specifications.	Steep slopes can be immediately stabilized with riprap to minimize erosion and ensure long-term stability.
Clean Gravel	25 mm washed gravel	Washed gravel.	Used for construction of berms, winter installation of silt fence, temporary cover, etc.
Geotextile	Class I Non-Woven	Class I Non-Woven Geotextile, (OPSS 1860) – 2 m wide roll.	Used for lining rock check dams.
Silt Bags	3.5 x 5 m	Non-woven geotextile.	End of pipe sediment control.
Turbidity Curtain	50’ x 6’ curtain with floats	50’ lengths typical, with 6’ deep panels.	Used within ponds, lakes, or streams to isolate work area from other water.

Product	Components	General Description	Potential Uses
Straw Bales	350 x 450 x 900 mm weighing approximately 23 kg	Locally sourced and verified weed free.	Check dam sediment barriers
Vegetation Matting	Rolled matting	Locally sourced and verified weed free.	Slopes can be stabilized with vegetation matting to minimize erosion. Also used in channels which will be exposed to water flow before vegetation establishment.

6.1.1 Environmental Protection Measures

The TL SEPSCP supports the application of the environmental protection measures described below. These measures are consistent with those presented in EcoLogic (2022). Section 3.5 (ESC Prescription and Compliance Requirements).

BW Gold is committed to regular and ongoing consultation with Indigenous groups during the transmission line construction period through the Environmental Monitoring Committee, which was established to facilitate information sharing and provide advice on the development and operation of the Project. BW Gold envisions ELoMC meetings will include a segment on the transmission line construction schedule and near-term construction activities (this could include a review of upcoming crossings, for instance). In addition, and in accordance with EAC Condition 17, the Aboriginal Monitors will also be engaged in Transmission Line construction in accordance with the respective Terms of Engagement and Aboriginal Groups Interest(s).

Riparian and stream crossings will adhere to Division 3 of the Forest Planning and Practices Regulation.

Timing of Works

- Clearing activities will be planned to coincide with periods of drier weather.
- Avoid soil handling or equipment movement during periods of intense rainfall (saturated soil conditions).
- Clearing activities will be completed as quickly as possible by ensuring all necessary equipment and materials are onsite and ready for installation to minimize the duration of disturbance activities.
- Work in and about a stream will occur outside of the critical fishery sensitive windows unless a timing variance is authorized.

Avoiding and Minimizing Effects

- The construction footprint will be minimized to the smallest area required for access, laydown, and construction.
- Avoid the introduction of invasive plants by adhering to the Transmission Line Integrated Vegetation Management Plan (TL IVMP).

Sediment and Erosion Control Measures

- Excavated soils will be stockpiled within the area approved for Project use and at least 15 m away from any drainage features, drains, ditches, and 30 m from any waterbody or water course.
- Ensure any sediment mobilization resulting from soil stockpiling or tracking from equipment/vehicles is cleaned up in a timely manner.
- Effective erosion and sediment control measures shall be installed before commencing construction to reduce the potential for introduction of sediment into any surface water feature (i.e., stream, pond, wetland, drain, or ditch) or watercourses in accordance with Land Development Guidelines for the Protection of Aquatic Habitat (Fisheries and Oceans Canada 1993) and Standards and Best Practices for Instream Works (BC Ministry of Environment 2004), unless otherwise specified.
- Contingency supplies of sediment and erosion control materials shall be maintained on site and workers shall be sufficiently trained in their appropriate installation and maintenance.
- Sediment and erosion control measures shall be:
  - inspected regularly at a frequency commensurate with the risk, nature, location, and seasonality of the work and adapted or revised, as appropriate;

  - repaired as necessary in a timely manner, commensurate with the risk, nature, location, and seasonality of the work; and
  - maintained until construction is completed and the affected areas are sufficiently stabilized and re-vegetated so there is minimal risk of erosion or sedimentation at the site because of construction activities.
- Erosion and sediment control structures (e.g., straw bales, vegetation matting) shall be verified weed free. In the event that straw bales or vegetation matting that has not been procured as weed-free are used on the TL ROW the proponent will document the location that these products were used. Any non-vegetated ground in the vicinity of these materials will be seeded with an approved seed mix and the area will be monitored for the growth of any invasive species.
- Control runoff and manage stormwater (for example rainfall or snow melt) and direct it away from construction areas where excavation, spoil placement, and staging activities occur.
- Ensure all natural drainage features in the construction area are protected from the release or inflow of sediment-laden water related to the activities.

Fish and Aquatic – Habitat Alteration, Disturbance, or Loss

- Ensure that no impacts (direct or indirect) occur to the riparian community around the watercourses or their riparian and instream habitat's form and function unless a *Water Sustainability Act* notification/ authorization or related federal authorization has been obtained. All conditions must be complied with.
- No debris, soil or other deleterious material resulting from construction-related activities will be allowed to enter watercourses or wetlands. Any debris, soil or other deleterious material introduced into watercourses will be removed, isolated, and treated or otherwise dealt with, so as to eliminate its ecological impacts; and documented and reported to the Construction Manager.
- When working during periods of heavy and/or prolonged rainfall, isolate the area of work and install appropriate sediment controls to prevent the release of sediment-laden water or any other deleterious substances into surface water.
- During construction conducted close to any watercourse, waterbody, or wetland, ensure materials are not pushed, allowed to fall, or eroded into the water or wetlands.
- Operate machinery on land above the high-water mark to minimize disturbance to the banks and bed of any watercourse or waterbody.
- Do not remove coarse woody debris from any waterbodies.

6.2 Surface Water Infrastructure to Minimize Erosion and Control Sediment

6.2.1 Surface Runoff Management

Natural topography and water management structures erected during the construction period (runoff collection ditches, diversion ditches and sediment ponds), will either divert non-contact water away from the worksite or direct construction-related contact surface runoff into a stabilized area where it can be effectively managed. There are two (2) types of construction-related water as follows:

1. Non-contact water that can run-off directly to the receiving environment with no treatment required.
2. Contact water that only requires treatment for sediments.

Freshwater Diversion Ditches

A diversion ditch is a channel lined with vegetation, riprap, or other flexible material designed for the conveyance and management of non-contact surface runoff to a receiving system without causing erosion.

Contact Water Collection Ditches

A runoff collection ditch intercepts construction water runoff and diverts it to a stabilized area where it can be effectively managed. Collection ditches are used within applicable areas to collect runoff and convey it to appropriate sediment control measures. General locations and conditions may include:

- Below disturbed existing slopes to divert sediment-laden water to control facilities;
- At or near the perimeter of the construction area to prevent sediment-laden runoff from leaving the site; and
- Below disturbed areas before stabilization to prevent erosion.

Collection ditches will be temporary structures and will convey the runoff from the area to sediment ponds.

Sediment Ponds

Sediment ponds are for reducing sediment loadings when other erosion control or sediment control methods are insufficient. Sediment pond design and performance requires a large enough pond area to settle materials present, use of erosion control methods upslope of the pond, and assessment and determination of the need for settling aids.

6.2.2 Work in and around Water

The following are standard (typical) mitigation measures that shall be considered when preparing work procedures for working in or around water:

- Critical erosion control measures (e.g., silt fence, fibre roll log, erosion control blanket) must be in place and functional before, during, and after site construction operations have been completed. Typical details for these critical ESC measures are shown on Appendix A - Typical Cross Section Drawings. Table 6.1-2 includes potential Erosion and Sediment Control products for use.
- Concrete station, stockpiles, laydown, storage, pump discharge, and equipment maintenance area locations will be a minimum of 30 m from any watercourse or waterbody.
- If practicable, work will occur during the construction window of least risk for fish bearing watercourses. Crossings of fish bearing streams have been designed as clear span bridges to negate the need for instream works by ensuring that the structure can be constructed completely outside of the highwater mark. Vegetation will be maintained on the banks and in the areas directly in front of the timber sills. As the structures will be installed without impacting the stream, the structure can then be installed outside of the Window of Least Risk for Fish Bearing Watercourses.
- The reader should also refer to EcoLogic (2022), Section 3.5 (Prescriptions and Compliance Requirements) for additional information.

6.2.3 Phasing of Construction and Intended Sequence of Major Activities

A preliminary construction phasing list to be considered when planning construction activities for the transmission line includes the items listed below:

1. Identify applicable cut/fill phasing of grading activities. The Contractor will work to establish a grading plan so that tree clearing, and vegetation removal is done in segments/reaches so that large areas are not cleared without the provision of adequate erosion and sediment control measures.
2. Install strategic ESC measures (fibre roll logs, silt fence and erosion control blankets) downgradient of active construction work areas, where required.
3. Construct temporary diversion and drainage swales to direct water to designated area(s) and stabilize as required.
4. If spoil stockpiles near open waterbodies are intended to remain in place longer than 48 hours, the stockpile soil will be covered with appropriate materials to prevent erosion and or dust formation.
5. Once the conveyance ditches are completed and commissioned, all temporary bypass flows will be re-directed to convey surface water to newly constructed conveyance ditches.
6. Monitor and remove accumulated sediment from traps and temporary measures before the design capacity has been reduced by 50%.
7. Following heavy rainfall events ESC measures will be inspected to ensure effectiveness and maintenance will be conducted as required as per Table 7-1: Incident Monitoring Triggers and Actions in Section 7.

The reader should also refer to EcoLogic (2022), Section 3.5.1 (Prescriptions and Timing).

6.3 Operations

6.3.1 General Approach to Natural Recovery Processes

Understanding critical steps in the natural recovery process can assist in the identification of site-specific prescriptions for surface erosion and can provide direction for the most applicable techniques for overcoming the obstacles to disturbance recovery. The key is to identify the factors preventing natural recovery and tailor mitigation strategies to address these factors in a manner like what would occur naturally in the long-term (Polster 2009). Natural recovery and engineering with nature are also discussed in EcoLogic (2022, Section 3.7.1 Engineering with Nature).

Some of the most basic processes of primary succession, as noted by Bradshaw (2000) are:
(1) immigration and establishment of appropriate species, which can be improved by strategically planting species to minimize dispersion distances and prepare the growing surfaces to assist in germination success, (2) stabilization and accumulation of fine-textured soil, which may be accomplished by applying growth media and large woody debris to coarse ground, and (3) soil nitrogen accumulation, which can be assisted by planting nitrogen-fixing species.

Appropriate efforts made during the planning stage to address the processes described above can reduce both the application and maintenance costs of erosion control. Erosion control prescriptions suitable for specific disturbance areas can also enhance the natural recovery process. Table 6.3-1 indicates some limiting factors that may impede natural recovery, solutions that occur naturally to overcome these obstacles, and general options for strategies to enhance or induce natural solutions. Note that many of these principles overlap those of effective erosion prevention.

Table 6.3-1: List of Limiting Factors that Impede Natural Recovery Process

Obstacle	Natural Solution	Enhanced Solution
Steep slopes	Erosion occurs until slopes are stable; pockets of growth in areas of collected organic matter	Recontour slopes; strategically select locations for planting; bioengineering techniques
Rapid erosion	Rough and loose surfaces; large woody debris; vegetative covers that minimize erosion	Mechanically roughen up surfaces, apply large woody debris, select species mixes for quick establishment and effective ground cover
Compaction	Vegetation and weathering promote compaction	Mechanically roughen up surfaces
Moisture deficit	Weathering to small particle sizes	Apply growth media and/or mulch
Nutrient deficiency	Nitrogen fixing pioneering species	Apply growth media and or mulch, select nutrient fixing species, fertilize
Lack of seed sources	Pioneering species with widely dispersed seed	Pocket planting to provide seed sources over large areas
Lack of micro-sites	Rough and loose surfaces	Mechanically roughen up surfaces

** Modified from Polster (2009).*

6.4 Reclamation

The approach to reclamation involves the principles of the ESC and natural processes described above. The primary techniques that will be applied are:

- Drainage Control and Protection of Watercourses;
- Overburden Application and Surface Preparation; and
- Re-vegetation.

Together, these techniques will address the key points of the overall reclamation approach. More specialized techniques will be required in some areas, to be determined on a site-specific basis. Fundamentally, all efforts will be made to prevent erosion using the best practices available, while the need for sediment control techniques will be gradually eliminated unless necessary or for interim requirements.

Drainage within the disturbed areas will maintain natural drainage patterns. This will be accomplished with appropriate contouring, removal of temporary diversion systems and sediment control features, and restoration of surface water channels.

6.4.1 Drainage Control

One strategy integral to the overall water management approach is to design drainage of the site to replicate natural conditions. Designing landforms that mimic pre-development or natural conditions in the watersheds helps stabilize soil, prevent erosion, and prevent introduction of sediment to the aquatic environment. Drainage control practices will include ditching, grass-lined ditches, cross drains, and diversion dikes.

6.4.2 Overburden Application and Surface Preparation

All sites to be re-vegetated will require surface preparation to provide suitable conditions for seeding or transplanting. (TL IVMP) The most significant strategy that stems from the reclamation philosophy described above is that of a rough and loose surface preparation. This technique draws from the basic principles of effective ESC and promotes development of sustainable vegetation. The process follows the steps of contouring to the desired landform shape and optimal drainage with the objective of minimizing slope length and gradient as much as possible, applying overburden or other fine-textured growth media to improve moisture content and nutrient availability, and mechanically disturbing the surface, leaving it rough and loose on the finest scale practical.

Plants require a growth medium of suitable texture and organic matter content that allows for root penetration, provides a suitable moisture regime, and contributes desirable nutrients. Salvaged overburden will be used to provide a growth medium during reclamation where practicable.

Disturbed surfaces will be mechanically decompacted where practical, providing significant benefits for erosion prevention, including the establishment of plant microsites, and fostering surface stabilization through re-vegetation.

Particular attention will be paid to the presence of invasive species within the project site during operation and during the closure and post closure phase. Invasive plant monitoring will be conducted in accordance with the TL IVMP.

6.5 Emergency Preparedness

To facilitate preparedness of possible emergency ESC incidents during the Construction phase, the contractor will keep an inventory of ESC material accessible at work sites. The inventory will consist of but not limited to:

Description	Quantity
Silt fence rolls with wooden stakes	10 Rolls at 30 m each
Rolled erosion control products with staples	10 Rolls at 30 m each
Floating turbidity curtain	5 rolls at 15m each
Silt curtain	10 Rolls at 30 m each
Fiber rolls	500 m total length
Stockpiles of boulder and clean sand	$15m^3$ of each product
Sandbags	1,500 bags

During the Construction phase, the Contractor will store the emergency ESC materials at a location considering the number or work fronts, location of work fronts, and level of risk, or the areas of greatest risk. The storage location of the ESC emergency incident materials will likely change during the Construction Phase as the work front progresses.

During the Operation, Closure, and Post Closure phases of the project, BW will store the emergency ESC materials at a location(s) considering the number or work fronts, location of work fronts, and level of risk or the areas of greatest risk. The storage location(s) of the ESC emergency incident materials will likely not change during these phases of the project. The location(s) and quantities of materials will be established by the EM and reviewed on a regular basis per the appropriate EMS protocols.

7.0 Monitoring

Condition 29 of the EAC requires the development of a TL specific Sedimentation Monitoring Plan focused on YDU-WL Class 1 Waterbodies as set out in Appendix 1 of the EAC and other waterbodies identified to be of cultural significance by other Aboriginal Groups during TL construction and maintenance activities. Section 7, provided herein, is meant to provide guidance and instruction for site personnel and contractors on sediment monitoring activities. Refer to EcoLogic (2022), Section 3.5.1 Prescriptions and Timing.

In general, event-based sediment control effectiveness monitoring will be conducted at areas of concern during spring freshet and after large rainstorms and snowmelt events (refer to Table 7-1: Incident Monitoring Triggers and Actions). Regular inspections performed by qualified personnel will ensure that control measures are intact and functioning. Visual inspections of sediment control structures will include assessments of the structure's physical integrity and signs of accelerated erosion. Any damages to control measures or excess sediment build-up will be assessed and modified accordingly. Once disturbed areas are adequately re-vegetated to provide effective erosion control, inspection frequency will decrease.

7.1 Monitoring, Measurement, Analysis, and Evaluation

Erosion and sediment control elements will be inspected and maintained, with an emphasis on adaptive management to quickly evaluate and respond to changing conditions and requirements. Key measures will include:

- Assessing the performance of erosion and sediment control elements and systems; and
- Identifying and promptly addressing areas where maintenance, upgrades, modifications, or additional mitigation measures are necessary.

Visual inspection and assessments of water management elements and systems will be incorporated on an ongoing basis as part of general construction. On active work sites, these informal visual surveys will be augmented by formal, regularly scheduled inspections to be performed by environmental technicians at an appropriate frequency as dictated by site conditions and with oversight from the project QP-CPESC for ESC. In frozen conditions, formal inspection frequency may be reduced. The QP-CPESC or their designate will be empowered to issue Work Stoppages as conditions indicate. This is discussed in EcoLogic (2022), Section 3.10 Work Stoppages.

Water management and erosion and sediment control elements will be regularly inspected and maintained. Maintenance procedures will include prompt attention to potential ditch or culvert blockage or failure, or outside seepage. Maintenance will also include routine removal of accumulated sediment from ditches and retention structures.

The project QP-CPESC or other designated person will be responsible for overseeing the erosion prevention and sediment control monitoring program, maintaining inspection and maintenance records, ensuring reporting of TSS data as required, and providing guidance on any changes or needs to the program.

Construction personnel will be required to report any potentially adverse incidents of erosion, structural, or function failure, culvert debris accumulation, or similar occurrences to the Construction Manager.

Table 7-1: Incident Monitoring Triggers and Actions

Roles	Trigger – Minor	Trigger – Moderate	Trigger – Major
First person On the Scene (First Responders) will assess conditions to determine the initial Trigger to be applied.	*Examples of Minor Triggers:* • *Freshet Preparation.* • *Old and non-active erosion events.* • *Small Rills, non-active.* • *Equipment required is as per normal activities for maintenance and minor repairs.* • *Small, easily manageable erosion events.* • *Standing water in non-designated areas.*	*Examples of Moderate Triggers:* • *Active ditch erosion.* • *Existing Freshet Conditions.* • *24-hr storm events >44 mm rain precipitation (2-Year return period).* • *Conditions that are active and have the potential to cause operational changes due to access restrictions or have potential for threats to infrastructure.* • *Standing water in non-designated areas that have potential for mobility or interfere with operations.*	*Examples of Major Triggers:* • *Slopes with active gullies and erosion channels where large volumes of sediment including rock is entrained.* • *Immediate threats to infrastructure.* • *Major sedimentation threats to water bodies.* • *24-hr storm events >73 mm rain precipitation (10-Year return period).* • *Prolonged heavy rainfall events > 3 days.* • *Standing water in non-designated areas that have potential for mobility or interfere with operations in high risk/critical areas.*
First Responder - first person on the scene who discovered the event. **Project Engineer** - personnel designated to perform inspections.	1. Note areas where erosion event has occurred, notify Supervisor. 2. If possible, redirect flows or correct event immediately. 3. Inspectors to note culverts that may be plugged and that may need attention to be ready for spring freshet flows. 4. Investigate source of erosion event as necessary to prevent repeats or to reduce/remove potential for larger event.	1. All Minor Response duties. 2. Provide immediate actions/assistance as necessary to minimize negative effects of erosion event if safe to do so. 3. Notify EPC contractor of event including location, potential for damage, proximity to water body, and safety aspects.	1. All Moderate Response duties. 2. Prevent entry by non-essential personnel and maintain a safe distance. 3. If safe to do so, minimize negative effects. 4. Release the scene to Mine Rescue upon their arrival as necessary.
EPC Contractor	1. Provide assistance to First Responder/Inspector as necessary.	1. All Minor Response duties. 2. Determine level of effort required to mitigate the hazard and repair the damage. 3. Organize mitigations/repairs. 4. Notify Environmental Manager, if associated with water bodies or in receiving environment. 5. Notify department superintendent/superintendent as necessary.	1. All Moderate Response duties. 2. Depending on gravity of situation, initiate Mine Emergency Response Procedures. 3. Ensure safety of the First Responder and safety of the crew by preventing non-essential personnel from entering area. 4. Notify Engineering and Environmental Departments. 5. Notify Project Engineer.
Environmental Monitor	1. Schedule inspections and designate inspectors in fall periods for freshet readiness in spring. 2. Share notes of inspections with EPC Contractor and Construction Manager as necessary. 3. Review SEPSCP and revise as necessary. 4. Ensure revisions are communicated to all affected departments.	1. Respond to notifications for further inspection. 2. If sedimentation into waterbody, perform up and downstream samples for water quality to determine compliance. Note: Full suite samples may be necessary. 3. Direct environmental/erosion controls that may have to take place to mitigate impacts, reduce environmental hazard. 4. Record event and mitigations for reporting purposes.	1. All Moderate Response duties. 2. Notify Environmental Manager 3. Prepare for and assist in receiving environment investigations and impact assessments.
Construction Manager	1. Schedule inspections and designate inspectors in fall periods for freshet readiness in spring. 2. Share notes of inspections with Environment Monitor as necessary.	1. Provide resources/guidance to event responders as necessary. 2. Determine if outside agencies are required to provide assistance. 3. Determine courses of action to prevent/mitigate damage to resources.	1. All Moderate Response duties. 2. Notify Environmental Manager. 3. Notify Safety Lead. 4. Notify Mine Manager.

Roles	Trigger – Minor	Trigger – Moderate	Trigger – Major
Environmental Manager	1. Duties as normal.	1. Report event to external agencies, Indigenous groups as necessary.	1. All Moderate Response duties. 2. Provide recommendations to senior management on risks, mitigations, and impacts.
Mine Manager	1. Duties as normal.	1. Duties as normal.	1. Notify Corporate Executive as necessary. 2. Ensure all necessary funding and resources are provided in an efficient manner.

The role of Aboriginal Group Monitors in incident monitoring and actions would be contemplated as part of the monitoring plans developed by Aboriginal Groups pursuant to the plan developed to satisfy EAC condition 17.

7.1.1 Incident Monitoring

A TARP will also be implemented if signs of erosion are noted on site during the construction or active maintenance phases of the transmission line project. Three levels of qualitative triggers have been defined: examples of each trigger level and roles and responsibilities for the implementation of subsequent actions are summarized in Table 7-1: Incident Monitoring Triggers and Actions.

7.1.2 Total Suspended Solids Monitoring

Surface water TSS and turbidity monitoring will be implemented where identified in EAC Plan 29 as required or as otherwise determined during project activities by the project QP-CPESC.

7.1.3 Quality Assurance / Quality Control

Quality assurance/quality control (QA/QC) principles will follow those outlined in guidance documents throughout the field sample collection and laboratory analysis phases (BC MOE 2012; Environment Canada 2012c; Clark 2013). All water quality samples will be collected by qualified personnel using suitable sampling equipment. Samples will be collected in appropriate containers and transported and stored following accepted procedures. Chain-of-Custody forms will be used to track the samples and analyses will be conducted by an accredited laboratory.

The instrument used to measure turbidity samples on-site will be calibrated as per manufacturer recommendations to ensure QA/QC. A calibration log will be kept for each turbidity meter unit indicating last calibration and maintenance.

7.2 Nonconformity and Corrective Action

Water quality results will be compared against one or more relevant water quality guidelines. If the turbidity reading and TSS concentrations exceed the established limits, the BW EM will notify the Construction Manager. Additional mitigation measures will be implemented to reduce the sediment loading to the receiving environment if required to achieve levels that are acceptable for discharge.

During and after an exceedance event, additional turbidity samples will be taken at key locations. This is described in more detail in EAC Plan 29.

7.3 Incident Identification

Employees will be encouraged to report signs of erosion within the TL RoW. When signs of erosion are observed, the affected site will be addressed in a timely manner to minimize additional erosion by applying the appropriate erosion control techniques. The affected area will continue to be monitored until erosion has been controlled and is no longer a concern.

Environmental incidents caused by uncontrolled release of sediment will be communicated by the individual who detects an incident to their supervisor and to the BW Environmental Department. The project QP-CPESC for ESC will also be notified immediately and their expertise and guidance sought and followed to ensure compliance is re-established and maintained.

Key information that should be documented during an incident resulting from erosion or sediment release includes:

- Location, cause, and nature of the incident;
- Environmental or Project features affected (e.g., road, watercourse, forest land, infrastructure);

- Time, extent, and magnitude/quantity of material or area affected;
- Response and actions to control the incident;
- Any follow-up tasks required, mitigation/remediation/corrective actions, or additional sampling needs; and
- Photographs, GPS location, and a map may be included for clarification and understanding of proximity risks.

Notification and communication of identified incidents will be made within the Project team. Aboriginal Groups, outside agencies and other stakeholders will be notified based on reporting requirements outlined in the TL SMP-FG document and in accordance with the Accidents and Malfunctions Administration and Communication Plan.

8.0 Reporting and Record Keeping

8.1 Reporting

Erosion prevention and sediment control records will be maintained, including existing surface water management/treatment measures and assessment of their performance, repairs or mitigation activities undertaken, and a log of dated photographs. The reports will be kept in the Construction office or another designated area. The EM or Environmental Monitor(s) will prepare weekly (during the open water season e.g., April – October, monthly during the winter season) and monthly monitoring reports that will include the following information:

- Summaries of environmental monitoring (e.g., date and time of each sample, weather conditions);
- Sampling results (e.g., receiving water results compared to Maximum Allowable Increase levels for any works in and around water, instrument calibration records, etc.); and
- Documentation of all non-compliance instances, including the level of exceedance, the duration of exceedance, the mitigation measures taken, verification of the reporting of the exceedance and any related communications with regulators regarding the exceedance event, and future measures to be taken to avoid or control further exceedances.

Following completion of the construction activities, the EM or Environmental Monitor(s) will prepare a completion report that includes the following information specific to this SEPSCP:

- Maintenance activities;
- Inspection results;
- Assessment of the effectiveness of the BMPs based on the sampling results; and
- A brief description of ongoing activities at the site related to maintenance and monitoring of site areas.
- Reporting requirements in accordance with EcoLogic (2022), Section 3.9 Reporting Requirements.

8.2 Incident Reporting

Reports will be prepared for environmental incidents related to the TL SEPSCP that occur within the Construction area. Reports will be forwarded to government agencies as required by regulations and permits and to the IEM. Reports will also be forwarded on request to Aboriginal Groups based on established communication protocols. Based on the opinion of the QP or their designate, a Work Stoppage may be issued (refer to EcoLogic (2022, Section 3.10 Work Stoppages.)

8.3 Record Keeping

Monitoring data will be entered into an electronic database and have quality control checks completed upon receipt of results. Data will be entered into a standard format that allows for data reporting and analyses. Data and data comparisons will be stored in a single file format for each type of survey or monitoring activity.

9.0 Evaluation and Adaptive Management

9.1 Onsite Inspection and Plan Review

Inspection and maintenance are vital to the performance of erosion and sedimentation control measures; therefore, the success of the TL SEPSCP is dependent on monitoring of implemented BMPs.
The construction personnel / sub-contractors, project QP-CPESC for ESC, and IEM will inspect all erosion control measures weekly during spring freshet and monthly outside of freshet and in open water period, as well as after each significant runoff-producing rainfall event as per Table 7-1: Incident Monitoring Triggers and Actions. Silt fences, sediment traps/basins, ditches, culverts, and sediment control ponds will be visually inspected for the following:

- Excess sediment build-up;
- Structural/physical integrity; and
- Anticipated wear and tear.
- Sediment removal and proper disposal will be performed as required.

Once the ESC measures have been installed, their effectiveness will be monitored by the project QP-CPESC for ESC and the IEM and maintenance will be carried out, as necessary. All ESC measures will be inspected by the construction personnel / sub-contractors and/or project QP-CPESC for ESC and/or IEM before and after following heavy rainstorms or snowmelt events such as spring freshet during the Construction Phase. Immediate action will be taken by the construction personnel / sub-Contractors when the need for maintenance or repair of ESC measures is identified for the ongoing performance of the measures. Monitoring will include but not be limited to the following:

- New erosion control prescriptions will be developed, as needed based on encountered or anticipated erosion of disturbed soils, slopes, and ditches. Initial erosion will be inspected visually by searching for light surface material (litter or soil) movement, while sedimentation resulting from erosion will be determined by searching for deposition of soil particles at the bottom of slopes and depressions. Rilling, gullying, pedestalling, and unusual compaction are also indicators of erosion and will be recorded if and when observed.
- Sediment accumulation in ditches, check dams, and sumps will be identified, and maintenance actions will be recommended where needed.
- Revegetated areas will be monitored for evidence of wind and water erosion; remedial seeding and erosion-control measures will be applied when required.

The Environmental Manager together with the Contractor Construction Manager and the project QP-CPESC for ESC will modify the TL SEPSCP, when necessary, to reflect changing site conditions or new information which has been identified during construction.

9.2 Continuous Improvement

The design of ESC measures should be viewed as a flexible process that responds to new information obtained throughout the Construction Phase. Contingency strategies for the Project will be active and adaptive, with ongoing inspection, maintenance, and re-evaluation for all BMP control measures and surrounding site conditions. If monitoring identifies that BMPs are not functioning adequately, the following steps will be taken:

- Confirm control measure/feature installed correctly.
- Assess appropriate size or length/depth of control method with site circumstances.
- Determine if alternate BMP/control method or contingency measures are required.
- Assess if increased maintenance/inspections required.

An inventory of ESC materials will be kept on site to address problems that may arise. The inventory list will be updated regularly to reflect a more accurate estimate of the quantities that should be stocked on site. The materials will provide a spectrum of measures to address a broad range of site conditions and severity.

Adaptive management enables a dynamic context for continually improving the management approach by adjusting the decision-making process with the learning from the field outcomes and updated information available. Adaptive management also promotes proactive measures that ensure that contingency plans will be in place and extra materials available before the beginning of any construction activity so that preventative or corrective responses are ready to be quickly implemented if needed.

As part of the adaptive management strategy, this document will be used as guidance for specific work tasks or procedure creation for activities during construction, operations and during reclamation phases of the Project.

10.0 Plan Revision

The TL SEPSCP is a ‘living document’ any plan revisions will be made in accordance with the plan this is appended to (Condition 13 – Construction Environmental Management Plan).

11.0 Qualified Professionals

Under the direction of Allnorth Consultants Limited, this management plan has been prepared by the author and reviewed by the QPs:

Prepared by:	Reviewed by:
Original signed	*Original signed*
Mike Padula Project Manager	David Watt, R.P.F. Registered Professional Forester

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Appendix A Typical Cross Section Drawings

SILT FENCE (FILTER FENCE)

SEDIMENT CONTROL

DESCRIPTION AND PURPOSE

- Permeable fabric barriers installed vertically on support posts along contours to collect and/or filter sediment laden sheet flow runoff
- Causes water to pond allowing sediment to settle out as water filters through fabric
- Decreases flow velocity in channels with low to moderate flows (< 0.03 m^3/s)
- Entraps and minimizes coarse sediment from sheet flow or overland flow from entering waterbodies
- Perimeter control for sediment transport and deposition

APPLICATIONS

- Temporary measure
- Used at bottom of cut or fill slopes to collect sediment laden runoff
- Used in swales or ditches with low flow velocity and flow less than 0.03 m^3/s
- Used along streams (or channels) banks
- Used around stockpiles
- Midslope grade-break (using "J-hook" or "smile" pattern to effect ponding, filtering and sedimentation)

ADVANTAGES

- Low permeability silt fences have high filtering capabilities for fine sand to coarse silt
- Filter fence more effective than straw bales at filtering out sediment

LIMITATIONS

- Applicable for sheet flow, normally cannot handle concentrated channel flow volumes
- May fail under high runoff events
- Limit to locations suitable for temporary ponding of sediment laden runoff
- Not to be used in swales or ditches with flow greater than 0.03 m^3/s
- Low permeability silt fences may not be strong enough to support weight of water retained behind it and may require reinforcement (i.e. wire mesh and stronger support post)
- Sediment build up needs to be removed at 1/2 height and on a regular basis
- Damage to fence may occur during sediment removal
- Useable life of approximately one year dependent on maintenance and sediment requirement

CONSTRUCTION

(Waiver: For guidance only. A site specific design is required from designer/engineer)

- Two methods of installation are commonly used
  - Trench method
  - Mechanical (slicing) installation method (e.g. Tommy Silt Fence Machine or equivalent)
- Trench Method
  - Select location of silt fence (usually along contours)
  - Drive support posts a minimum of 0.3 (preferable 0.6 m) into ground, spaced a maximum of 2 m apart
  - Excavate trench approximately 0.15 m deep by 0.15 m wide for entire length of fence along upstream side of posts
  - Attach the wire mesh or snow fencing, if used as reinforcement to fence fabric, to upstream side of posts with staples
  - Extend filter fabric to base of trench and attach over wire mesh or snow fence, if used, on upstream side of posts
  - Backfill and compact soil in trench, being careful not to damage fence
- Mechanical Installation Method
  - Select location of silt fence (usually along contours)
  - Use mechanical installation machine to embed the fabric a minimum of 0.15 m into the ground. One mechanical installation method is by slicing (with special equipment) the geotextile fabric to embed into the ground without excavation and backfill. Minor disturbance of ground if affected and only tamping of ground is required for compaction.
  - Drive support posts a minimum of 0.3 (preferable 0.6 m) into ground, spaced a maximum of 2 m apart
  - Attach the wire mesh or snow fencing, if used as reinforcement to silt fence fabric, to upstream side of posts with staples
  - Ex tend filter fabric to base of trench and attach over wire mesh or snow fence, if used, on upstream side of posts

CONSTRUCTION CONSIDERATIONS

- Site Selection
  - Size of drainage area should be no greater than 0.1 ha per 30 m length of silt fence
  - Maximum flow path length above silt fence should be no greater than 30 m
  - Maximum slope gradient above the silt fence should be no greater than 2H:1V
  - For use in swales, gradient should be less than 2% and drainage area less than 0.8 ha
- Fence should be placed on contour to produce proper ponding
- Fence should be placed far enough away from toe of slope to provide adequate ponding area (minimum of 1.8 m away from toe of slope is recommended)
- Ends of fence should be angled upslope to collect runoff
- Fence should not extend more than 0.6 m above grade
- Posts can be wood or metal material dependent on design and ground conditions Posts should be placed on downstream side of fence
- Posts should be driven at least 0.3 m (preferable 0.6 m) into the ground
- Posts should not be spaced greater than 2 m apart

- Wire mesh or standard snow fencing may be placed between the posts and filter fabric to provide additional strength and support reinforcement
- Filter fabric should be cut from a continuous roll to avoid joints (if joints are necessary, the wrapping of fabric around the fence post and a minimum overlap of 0.2 m with staples should be used to attach the fabric to the post)
- Fence (and wire mesh or snow fence, if used) should be attached to posts with heavy duty staples, tie wires, or hog rings
- Fence (and wire mesh or snow fence, if used) should be dug into a trench at least 0.15 m deep to prevent undercutting of fence by runoff
- Trench backfill should be compacted
- Long runs of silt fence are more prone to failure than short runs
    - Maximum length of each section of silt fence should be 40 m
    - Silt fence should be installed in 'J' hook or 'smile' configuration, with maximum length of 40 m, along contours allowing an escape path for ponded water (minimizes overtopping of silt fence structure)

INSPECTION AND MAINTENANCE

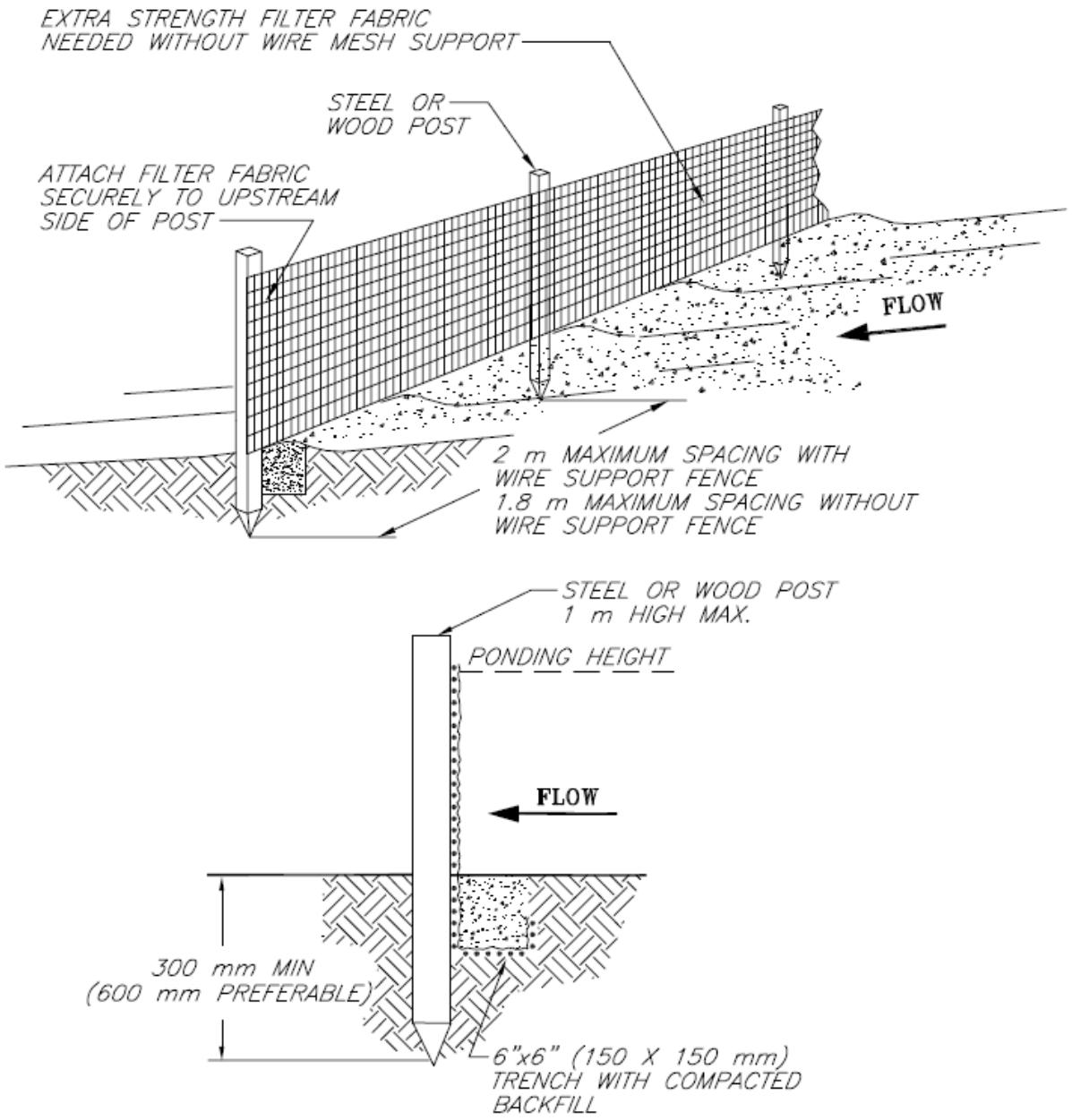
- Inspections should occur twice per week and after significant storm events (1:2 year storm event and/or +40 mm rainfall over 24 hours duration)
- Repair undercut fences and repair or replace split, torn, slumping or weathered fabric immediately
- Sediment build up should be removed once it accumulates to a depth of 0.2 m or at ½ height of fence
- Remove fence after vegetation is established
- Deactivate fabric by cutting-off top portion of fabric above ground; bottom trenched-in portion of fence fabric can be left in-ground thus minimizing ground disturbance

SIMILAR MEASURES

- Straw Bales
- Rock Barrier
- Check Dams
- Permeable/Synthetic Barriers

DESIGN CONSIDERATIONS

- For a silt fence e system to work as a whole, the following factors should be considered:
    1) quantity – adequate number and frequency of fence for efficient ponding and sedimentation
    2) installation – workmanship
    3) compaction – backfill and trenching of fabric
    4) support – posts adequately embedded and of strong material and close spacings
    5) attachment – secure fabric to post
- Install silt fences in a 'J' hook or 'smile' configuration to allow efficient ponding and sedimentation as well as escape route for excess runoff along the ends
    - Minimizes overtopping of structure



TRENCH METHOD OPTION DETAIL

NOTES:

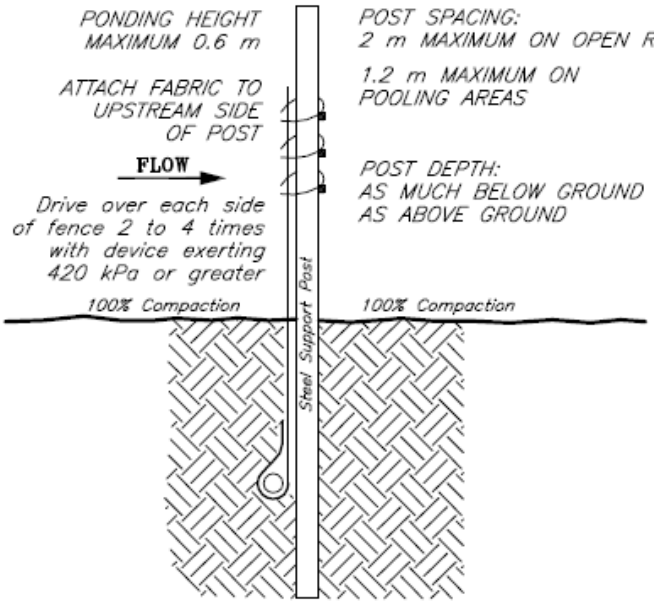
1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT (1:2 YEAR STROM AND/OR +40 mm RAINFALL OVER 24 HOUR DURATION) AND REMOVE SEDIMENT WHEN ACCUMULATED SILT REACHES 1/2 FENCE HEIGHT OR 225 mm MAXIMUM SUGGESTED STORAGE HEIGHT.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA WILL NOT CONTRIBUTE SEDIMENT OFF-SITE.
4. THIS FIGURE IS PROVIDED FOR GUIDANCE ONLY AND DOES NOT CONSTITUTE A DESIGN. A SITE SPECIFIC DESIGN IS REQUIRED FROM DESIGNER/ENGINEER.

NOT TO SCALE

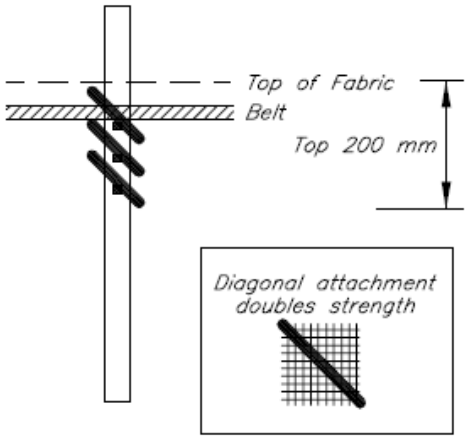
SILT FENCE

(TRENCH METHOD OPTION)

FILE: SILTFENC



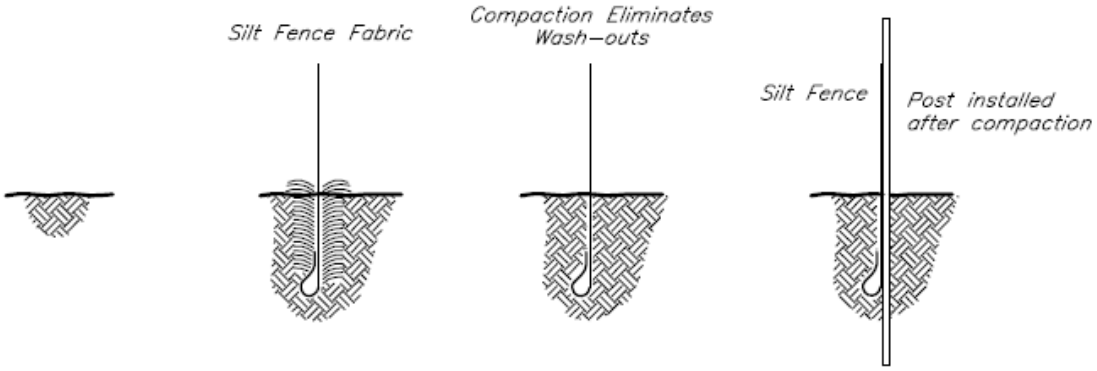
NO MORE THAN 0.6 m OF A 0.9 m FABRIC
IS ALLOWED ABOVE GROUND



ATTACHMENT DETAILS:

- Gather fabric at posts, if needed.
- Utilize three ties per post, all within top 200 mm of fabric.
- Position each tie diagonally, puncturing holes vertically a minimum of 25 mm apart.
- Hang each tie on a post nipple and tighten securely.
- Use cable ties (50 lbs) or soft wire.

THE MECHANICAL (SLICING) METHOD



a) Before Installation

b) During fabric insertion. Disrupted soil.

c) After Compaction. Greater stability.

d) Completed Installation

THE MECHANICAL (SLICING) METHOD INSTALLATION SEQUENCE

NOTES:

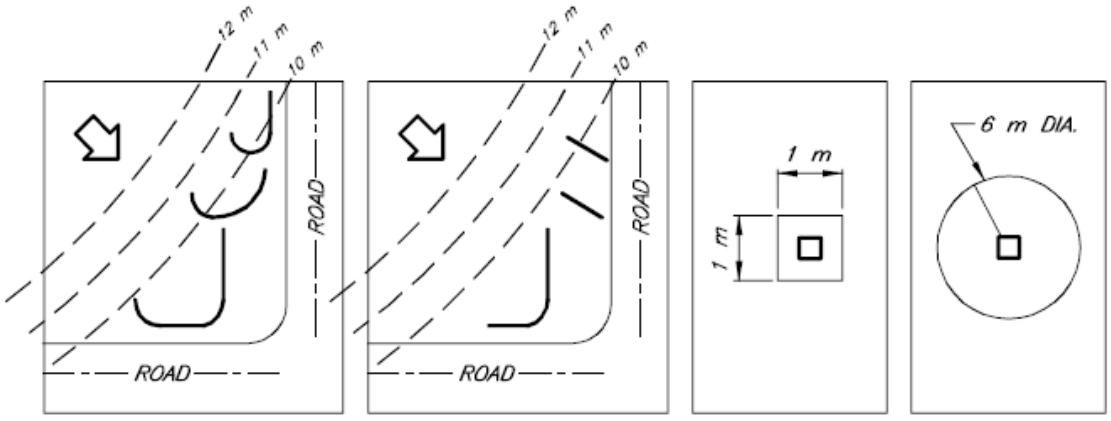
1. INSTALLATION MACHINE MUST ALLOW CONTINUOUS SLICING AND EMBEDMENT OF GEOTEXTILE INTO GROUND WITH MINOR GROUND DISTURBANCE.
2. INSTALLATION MACHINE TYPES WILL VARY WITH MANUFACTURER.
3. THIS FIGURE IS PROVIDED FOR GUIDANCE ONLY AND DOES NOT CONSTITUTE A DESIGN. A SITE SPECIFIC DESIGN IS REQUIRED FROM DESIGNER/ENGINEER.

NOT TO SCALE

SILT FENCE

(MECHANICAL METHOD OPTION)

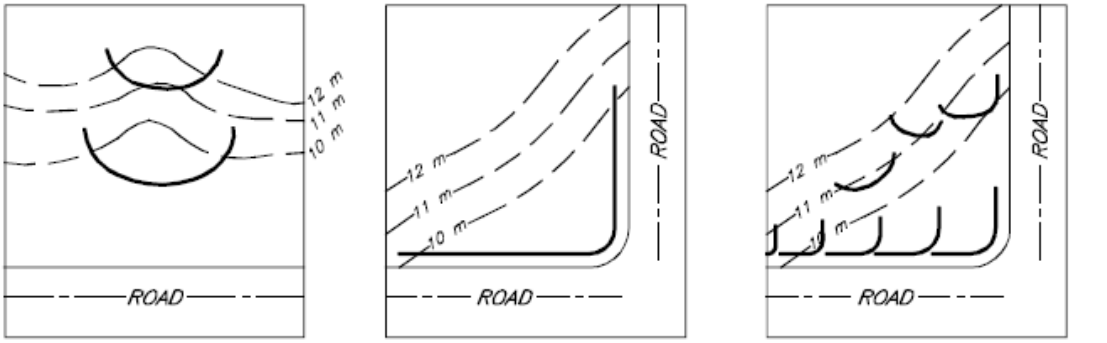
SOURCE: CARPENTER T. 2000



CORRECT INCORRECT

"J" CONFIGURATION

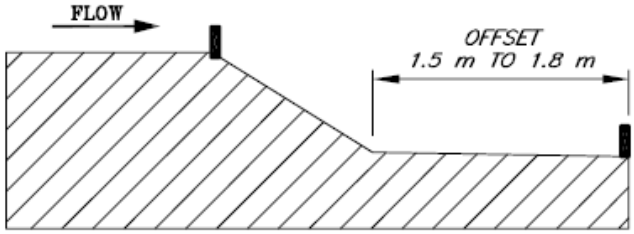
SILT FENCE BARRIER AT STORM INLET



"SMILE" CONFIGURATION

AVOID LONG INSTALLATION

COMBINATION OF "SMILE" AND "J" CONFIGURATIONS



LOCATION AT TOP AND BOTTOM OF SLOPE

NOT TO SCALE

NOTE:

1. THIS FIGURE IS PROVIDED FOR GUIDANCE ONLY AND DOES NOT CONSTITUTE A DESIGN. A SITE SPECIFIC DESIGN IS REQUIRED FROM DESIGNER/ENGINEER.

SOURCE: CARPENTER T. 2000

SILT FENCE (CONFIGURATION PLAN)

RMD #1

BRUSH OR ROCK FILTER BERM

SEDIMENT CONTROL

DESCRIPTION AND PURPOSE

- Temporary barriers of brush wrapped in filter fabric and secured in place, or rock anchored in place to intercept and filter sediment laden stormwater runoff from disturbed areas, retain sediment, and release water as sheet flow

APPLICATIONS

- Temporary measure
- Perimeter control
- Near toe of slopes subjected to sheet flow and rill erosion
- Along crest or tops streams and channels
- Around drain inlets
- Maximum drainage area of less than 250 m2 per 25 m length of barrier

ADVANTAGES

- May be equally effective filter as silt fences

LIMITATIONS

- Temporary measure only
- Maximum drainage area of less than 250 m2 per 25 m length of barrier
- Sufficient area behind berm required for ponding and clean out of sediment
- Not effective for diverting runoff (filters allow runoff to seep through)
- Rock filter berms are expensive to remove at completion of service life
- Not to be used across ditches, channels, or swales where high concentrated flows are anticipated

CONSTRUCTION

(Waiver: For guidance only. A site specific design is required from designer/engineer)

- Brush filter berm
    - Size of the brush filter berm will vary depending upon amount of material available and condition of the site
    - The height of the berm shall be at least 1 m tall and the width shall be a minimum of 1.5 m at its base
    - Berm is constructed by piling brush, roots, stumps and/or stones into a mounded row along contours
        - During clearing and grubbing, equipment can push the material into windrows along toe of slopes or other areas prone to erosion
    - Filter fabric is then laid across the berm, with edges overlapping, and secured in a trench immediately upstream of the berm
    - Trench shall be 15 cm wide and 15 cm deep and shall run for the entire length of the berm
    - The filter fabric in the trench shall be staked down with stakes spaced approximately 1 m apart
    - The trench is then backfilled and compacted over the staked filter fabric
    - The fabric is anchored with twine/wire to stakes on the downstream side of the berm
- Rock filter berm
    - Constructed similar to brush filter berm, replacing brush with rock (D50 = 75 mm to 150 mm)

CONSTRUCTION CONSIDERATIONS

- Use rock or brush material smaller than 150 mm in diameter, or use filter cloth to encapsulate the material, to promote filtration
- There is no predetermined shape for filters
- Water must be forced to filter through the berm and not flow around it
- Brush barriers can generally be constructed of clean organic material made available from clearing and grubbing operations that is normally burned or discarded
- Rock and brush filter berms are temporary measures and should be removed upon completion of service life, but not prior to revegetation of areas upslope

INSPECTION AND MAINTENANCE

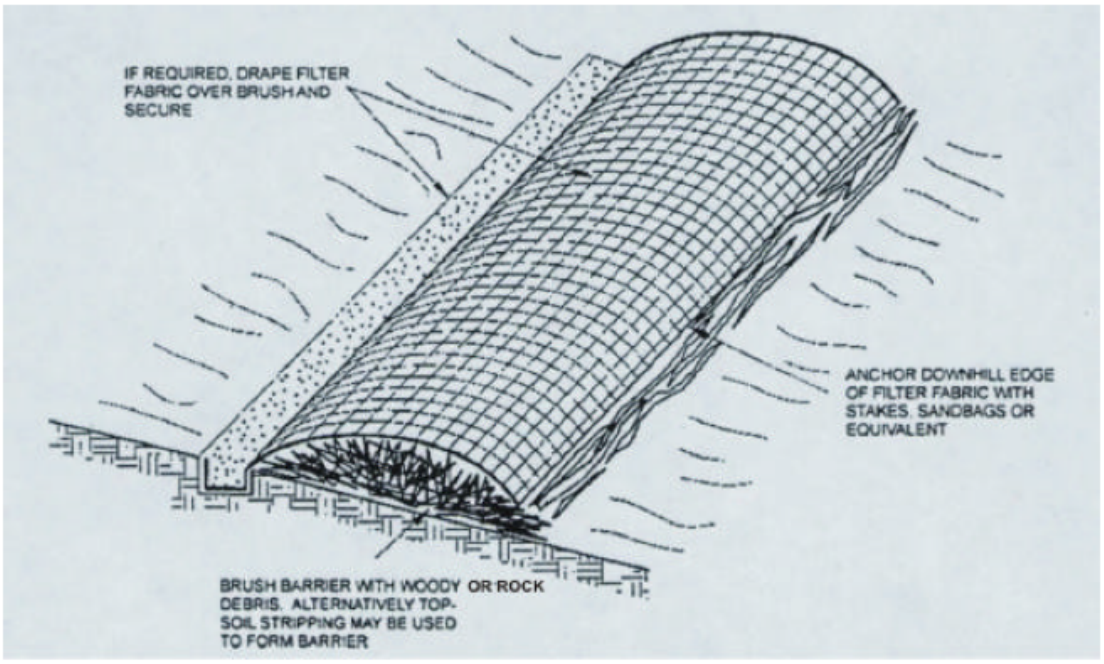
- Inspect berms on a weekly basis and before and after significant rainfall events (1:2 year storm event and/or 40 mm rainfall over 24 hours duration)
- Reshape berms as needed and replace lost or dislodged rock, brush, and/or filter fabric inspect for sediment accumulation and remove sediment when depths reach approximately one-third the berm height or 300 mm, whichever occurs first
- Inspect for toe undercutting, weathered/deteriorated filter fabric, and end runs and erosion of the filter and repair immediately

SIMILAR MEASURES

Berms/Barriers
Check Dams
Permeable/Synthetic Barriers
Sand/Gravel Bag Barriers

DESIGN CONSIDERATIONS

- Material properties
  - Rocks
  - Shall consist of hard, durable, clean mineral particles free of organic matter, clay lumps, soft articles, or other substances that might interfere with drainage and filtering properties
  - D50 of 75 mm to 150 mm preferable
- Brush
  - Material shall be less than 150 mm in diameter



NOT TO SCALE

NOTES:

1. EXCAVATE 100 mm X 100 mm TRENCH ALONG UPSTREAM SIDE OF BRUSH OR ROCK FILTER BERM.
2. DRAPE FILTER FABRIC OVER BRUSH OR ROCK FILTER BERM ENSURING UPSTREAM SIDE IS IN TRENCH.
3. BACKFILL AND COMPACT SOIL OVER FILTER FABRIC IN EXCAVATED TRENCH.
4. SECURE FILTER FABRIC OVER BRUSH OR ROCK FILTER BERM BY STAKING ON DOWNSTREAM SIDE OF BERM.
5. THIS FIGURE IS PROVIDED FOR GUIDANCE ONLY AND DOES NOT CONSTITUTE A DESIGN. A SITE SPECIFIC DESIGN IS REQUIRED FROM DESIGNER/ENGINEER.

BRUSH or ROCK FILTER BERMS

STRAW BALE BARRIER

SEDIMENT CONTROL

DESCRIPTION AND PURPOSE

- A barrier of strawbale primarily used as a perimeter sediment control measure
- May be used to intercept and retain sediment laden runoff allowing a portion of the sediment load to be retained

APPLICATIONS

- Temporary measure
- Suitable for flow velocities of 0.3 m/s or less
- Usually placed at 1m to 2 m offsets from toe of disturbed slopes
- Size of drainage area should be no greater than 0.1 ha per 30 m length of straw bale sediment barrier
- Maximum flow path length upstream of barrier should be less than 30 m
- Maximum slope gradient above the barrier should be no greater than 2H:1V
- May be used in conjunction with filter fabric as external wrap to encapsulate the bale

ADVANTAGES

- Straw bales are biodegradable
- Only requires one row of straw bales
- Easier to install than other barriers and economical if straw bales are readily available

LIMITATIONS

- Not appropriate for flow velocities greater than 0.3 m/s
- Require extensive maintenance following high velocity flows associated with storm events
- Not as robust as earth berms or continuous berms
- Susceptible to undermining and erosion damage if not properly keyed into substrate soil or if joints are not completely infilled with straw
- Short service life
- Must be installed by hand
- Not to be used on asphalt or concrete covered surfaces
- Availability of appropriate bales may be limited in certain areas of the province
- Maximum straw bale barrier height of one straw bale or 0.5 m maximum height

CONSTRUCTION

(Waiver: For guidance only. A site specific design is required from designer/engineer)

- Straw bale barrier should be located a minimum distance 1.8 m away from the toe of the slope to provide adequate ponding and sedimentation area
- Excavate a trench approximately 0.10 m deep with a width of one straw bale at the straw bale barrier location
- Place straw bales in excavated trench along contour, perpendicular to flow direction
    - Ensure twine or wire is not in contact with the soil
    - Ensure straw bale is in continuous contact with base of trench
    - Ends of barrier should be angled upslope to form enclosure to contain runoff
- Infill all joints with loose straw
- Drive two 50 mm by 560 mm section wooden stakes 1.2 m long through each straw bale, ensuring each stake is embedded a minimum of 0.15 m into soil
- Backfill and compact the upstream and downstream edges of the check structure to seat the straw bales into the subgrade

CONSTRUCTION CONSIDERATIONS

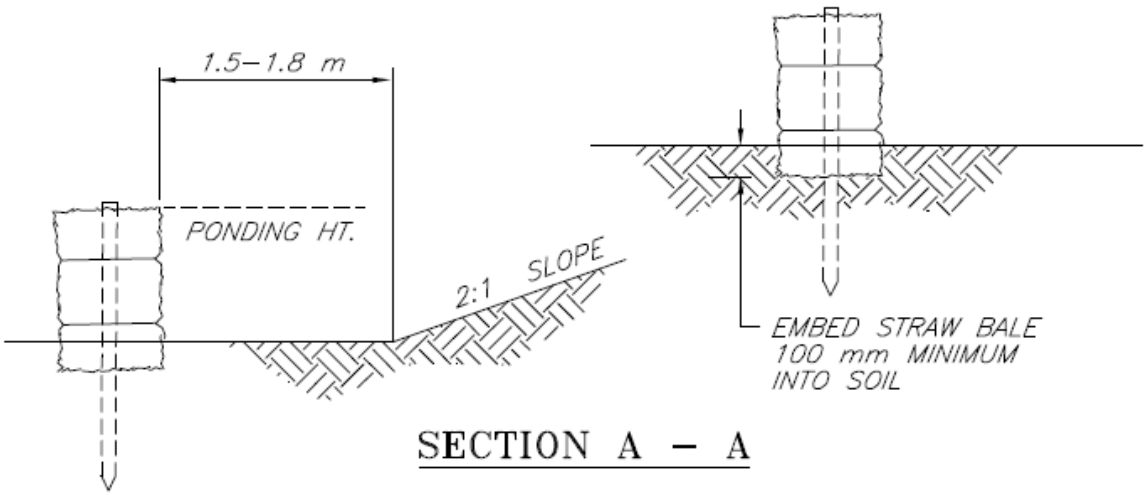
- Maximum lengths of barriers should be 40 m, including 'J- hook' or 'smile' (similar to silt
- fence) configuration, to allow escape route for excess runoff
- Barrier should be placed far enough away from toe of slope to provide adequate ponding and sedimentation area (minimum of 1.8 m away from toe of slope is recommended)
- Ends of barriers should be angled upslope (in a 'J-hook' or 'smile' configuration) to form enclosure to collect runoff
- Straw bales should be:
    - machine-made
    - Weed free cereal crop straw such as wheat, oats, rye, or barley
    - Tightly compacted and bound with two rows of wire or synthetic string and shall show no signs of weathering
- No more than one year old

INSPECTION AND MAINTENANCE

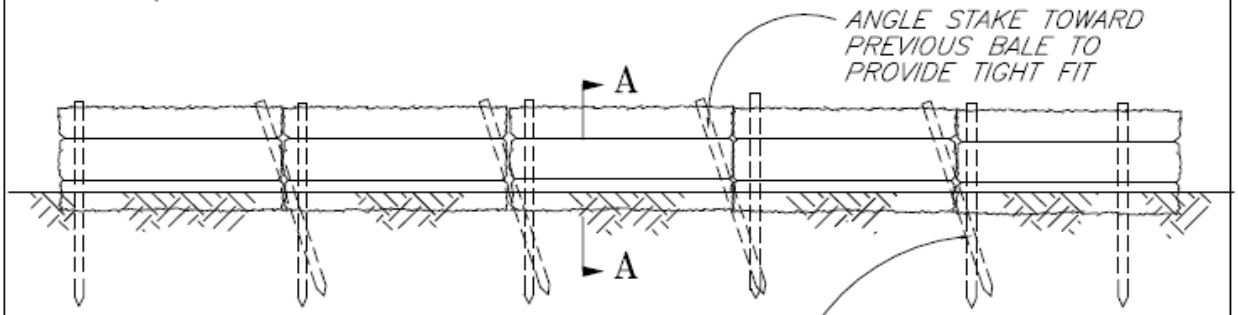
- Inspect barriers at least at weekly intervals and after each significant rainfall event (more than 25 mm in a 24 hour period)
- Remove sediment build up before it reaches one half the check barrier height
- Erosion repairs should be made immediately to prevent failure of the structure
- Replace damaged, decayed or dislodged straw bales immediately

SIMILAR MEASURES

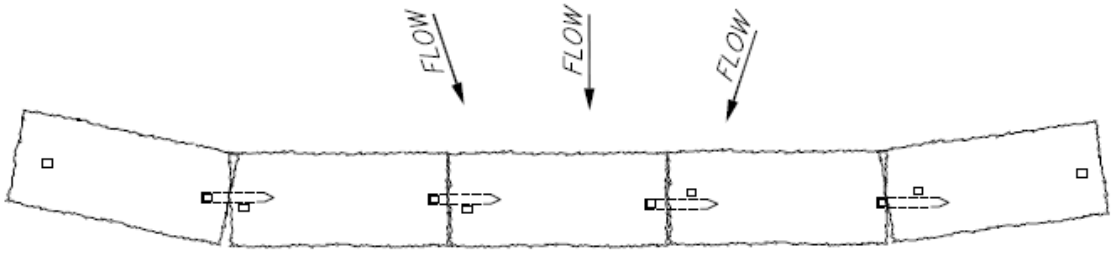
- Silt fences
- Continuous (earth- filled geotextile) berms
- Earth Dyke Barrier



SECTION A – A



SECTION B – B



PLAN

NOTES:

1. THE STRAW BALES SHALL BE PLACED ON SLOPE CONTOUR.
2. BALES TO BE PLACED IN A ROW WITH THE ENDS TIGHTLY ABUTTING.
3. KEY IN BALES TO PREVENT EROSION OR FLOW UNDER BALES.
4. THIS FIGURE IS PROVIDED FOR GUIDANCE ONLY AND DOES NOT CONSTITUTE A DESIGN. A SITE SPECIFIC DESIGN IS REQUIRED FROM DESIGNER/ENGINEER.

STRAW BALE BARRIER

FILE: STRWDIKE

ROLLED EROSION CONTROL PRODUCTS (RECPS): CHANNEL AND SLOPE INSTALLATION

EROSION CONTROL

DESCRIPTION AND PURPOSE

- Biodegradable or synthetic soil coverings used for temporary or permanent protection of disturbed soils at slopes and channels
- Categories of Rolled erosion control products (RECP) can be:
    - Erosion control blankets (ECB) (generally biodegradable and temporary)
    - Turf reinforcement mats (TRM)
    - Composite turf reinforcement mats (C-TRM)
- RECP may be manufactured of organic material, synthetic material, or as a composite of organic and synthetic materials
- Protect disturbed soils from raindrop impact and surface runoff erosion, increase water infiltration into soil, retains soil moisture and decreases evaporation loss
- Protect seeds from raindrop impact, runoff, and predators
- Stabilizes soil temperature to promote seed germination and enhance vegetation growth

APPLICATIONS

- Temporary or permanent measure
- May be used to protect disturbed, exposed soils for cut or fill slopes at gradients of 2.5H:1V or steeper
- May be used on slopes where erosion potential is high
    - Silts and sands have higher erosion potential than high plastic clays
- May be used on slopes where vegetation is likely to be slow to develop
- May be used to protect disturbed exposed soils in ditches and channels (with high flow velocities) by providing additional tractive resistance cover in conjunction with a successful high density vegetative growth established

ADVANTAGES

- Degree of erosion protection is higher, more uniform, and longer lasting than for sprayed-on products (e.g. mulches)
- Wide range of commercially available temporary (biodegradable) or permanent products

LIMITATIONS

- Non-performance of RECP may result from the following:
    - Low density vegetation growth (beneath RECP) due to non-favorable weather and growth conditions (i.e. soil type, moisture, storm events at critical times). It is noted that values of tractive resistance of RECP products for vegetative growth may be generally tested in laboratory after a growth period (e.g. 3 months) under greenhouse growth conditions. The effectiveness of RECP, especially along channels , is very dependent on success of vegetation growth on site. It is important that the designer should assess the effectiveness of RECP in accordance with site, soil, terrain and vegetation growth conditions.

    - Hydraulic uplift of RECP and erosion of underlying soils can occur under rapid snow melt conditions when dammed up melt water generates a hydraulic head and high flow velocity generated in constricted snow melt channel. This situation can occur along steep channels interlaced with drop structures and with RECP lining installed in-between the drop structures. Ponding of melt water and non-anchored RECP joint areas allow flow entry beneath the RECP and generate hydraulic heads to uplift the RECP. This can occur along un-anchored edges of RECP at upper edges of ditch when snow melt occurs at tops of ditch and flow beneath the RECP. This is especially critical when underlying soil is easily erodible. (e.g. fine grained non-cohesive silty soils). It is important to trench-in and anchor the edges of the RECP installations and installed anchor pin (staples) at sufficient dense intervals.

    - Ice buildup from groundwater seepage source can uplift and dislocate the RECP and causing flow beneath the RECP to erode the substrate soils. Winter ice accumulation may be related to groundwater regime and investigative design on subsurface drainage by a geotechnical engineer is required.

- Can be labour intensive to install
- Must be installed on unfrozen ground
- Temporary blankets may require removal before implementation of permanent measures
- Rolled erosion control products (RECP) are not suitable for rocky sites
- Proper surface preparation is required to ensure intimate contact between blanket and soil
- Plastic sheeting can be used at sensitive slopes with precautions:
    - Plastic sheeting RECP product can be easily torn, ripped, non-biodegradable, and should be disposed of in a landfill
    - Plastic sheeting product, if used, results in 100% runoff, thus increasing erosion potential in downslope areas receiving the increased flow volumes
    - Plastic sheeting should be limited to temporary covering of sensitive soil stockpiles or temporary covering of small critical unstable slope areas

CONSTRUCTION (SLOPES)

(Waiver: For guidance only. A site specific design is required from designer/engineer)

- RECP should be installed in accordance with manufacturer's directions
- The following is a general installation method
- Prepare surface and place topsoil and seed
- Surface should be smooth and free of large rocks, debris, or other deleterious materials
- Blanket should be anchored at top of slope in a minimum 0.15 m by 0.15 m trench for the entire width of the blanket

- The blanket should be rolled out downslope
    - Where the blanket roll is not long enough to cover the entire length of the slope, a minimum 0.15 m by 0.15 m check slot should be excavated at the location of the lap, and the downslope segment of blanket anchored in the check slot, similar to the method used for the top of the slope, or (2) when blankets, must be spliced down the slope, place blanket end over end (shingle style with approximately 0.10 m overlap. Staple through overlapped area at 0.3 m intervals.
    - The upslope portion of blanket should overlap the downslope portion of blanket, shingle style, at least 0.15 m with staple anchors placed a maximum 0.3 m apart
    - Adjacent rolls of blanket should overlap a minimum 0.1 m
    - Anchors should be placed along central portion of blanket spaced at 4/m2 minimum (0.5 m spacing) for slopes steeper than 2H:1V and 1/m² (1 m spacing) for slopes flatter than 2H:1V
    - Anchors along splices between adjacent rolls should be placed 0.9 m apart

CONSTRUCTION (CHANNELS)

(For guidance only. A site specific design is required from designer/engineer)

- A Blanket should be installed in accordance with manufacturer's directions
- The following is a general installation method
    - Prepare surface and place topsoil and seed
    - Surface should be smooth and free of large rocks, debris, or other deleterious materials
    - Begin by excavating a minimum 0.15 m deep and 0.15 m wide trench at the upstream end of channel and place end of RECP into trench
    - Use a double row of staggered anchors approximately 0.1 m apart (i.e. 0.2 m linear spacing) to secure RECP to soil in base of trench
    - Backfill and compact soil over RECP in trench
    - Roll centre RECP in direction of water flow on base of channel
    - Place RECP end over end (shingle style) with a minimum 0.15 m overlap downgrade
    - Use a double row of staggered anchors approximately 0.1 m apart to secure RECP to soil
    - Full length edge of RECP at top of sideslopes must be anchored in a minimum 0.15 m deep and 0.15 m wide trench
    - Use a double row of staggered staple anchors a maximum of 0.1 m apart (i.e. 0.2 m linear spacing) to secure RECP to soil in base of trench
    - Backfill and compact soil over RECP in trench

- Overlap RECP on sideslopes (shingle style down channel) a minimum of 0.1 m over the centre RECP and secure RECP to soil with anchors spaced a maximum of 0.2 m apart
- In high flow channels, a check slot across the width of the channel is recommended at a maximum spacing of 10 m to anchor the ends of the RECP to the underlying soil
- Use a double row of staggered staple anchors a maximum of 0.1 m apart (0.2 m linear spacing) to secure RECP to soil in base of check slot
- Backfill and compact soil over RECP in check slot
- Anchor terminal ends of RECP in a minimum 0.15 m deep and 0.15 m wide trench
- Use a double row of staggered anchors a maximum of 0.1 m apart (i.e. 0.2 m linear spacing) to secure RECP to soil in base of trench
- Backfill and compact soil over RECP in trench

CONSTRUCTION CONSIDERATIONS

- Slopes should be topsoiled and seeded prior to placing RECP
- Ensure blanket is in intimate contact with the soil by properly grading soil, removing rocks or deleterious materials, prior to placing blanket
- In channels, blankets should extend to above the anticipated flow height, with a minimum 0.5 m of free board
- For turf reinforcement mat (TRM), blanket should be placed immediately after topsoiling
- Blanket should be anchored by using wire staples, metal geotextile stake pins, or triangular wooden stakes
  - All anchors should be a minimum of 0.15 to 0.2 m in length
  - For loose soils, use longer anchors
- Blankets should be placed longitudinal to direction of flow, with fabric not stretched but maintaining contact with underlying soil
- It is essential to understand product specifications and follow manufacturer's instructions on installation methods

PRODUCT QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) CERTIFICATION

- RECPs should be certified by the supplier/manufacturer to ensure product performance and compliance with specified property requirements. A certificate for QA/QC testing of manufactured products is required. The performance and QA/QC testing should be carried out by reputable laboratories (e.g. TxDoT – Hydraulic and Erosion Control Laboratory OR equivalent laboratory) to ensure a commonly acceptable QA/QC standard. Dependent on product type and intended performance, the product information certificate should be provided by the product supplier/manufacturer to include the following:
- Manufacturer's Certification
- Performance specification
  - Permissible Tractive Resistance (include testing methods and vegetative growth conditions)
  - Permissible Flow Velocity (if available)
  - Longevity (for biodegradable or non-biodegradable products)
- Minimum Average Roll Values (MARVs) along with specified testing methods for
  - Physical properties
  - Mass per unit area

- Thickness
- Tensile strength
- UV Resistance
- Other physical properties (for non-woven below Erosion Mat (if specified)
- Grab tensile strength
- Grab elongation
- Puncture strength
- Trapezoidal tear
- UV Resistance

INSPECTION AND MAINTENANCE

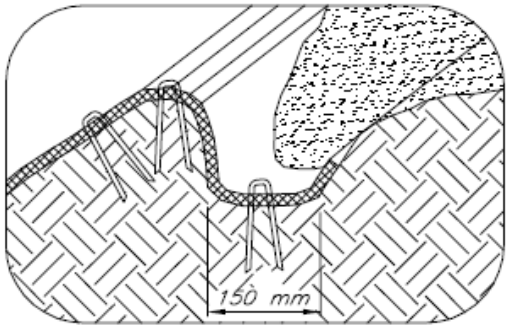
- Area covered with blankets should be regularly inspected/remediated, especially after periods of severe rainfall or storm events, to check for blanket separatio n or breakage
- Any damaged or poorly performing areas should be repaired/remediated immediately. Regrading of the slope by hand methods may be required in the event of rill or gully erosion.
- Inspection and maintenance should continue until dense vegetation is established
- Areas with low vegetation density should be reseeded
- After approximately one year, a top dressing of fertilizer may be applied to improve vegetation cover and assist degradation of temporary blankets

SIMILAR MEASURES

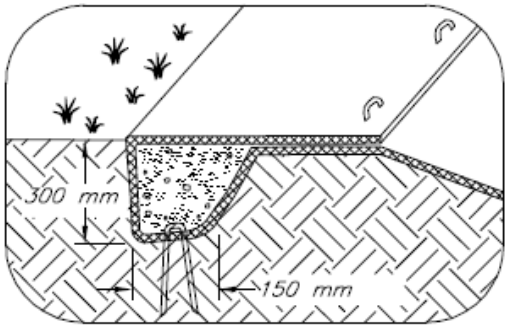
- Mulching (for slopes only)
- Chemical stabilization (for slopes only, e.g. Tackifiers)
- Rip rap (primarily in channels)
- Gabion mattresses (primarily in channels)

DESIGN CONSIDERATIONS

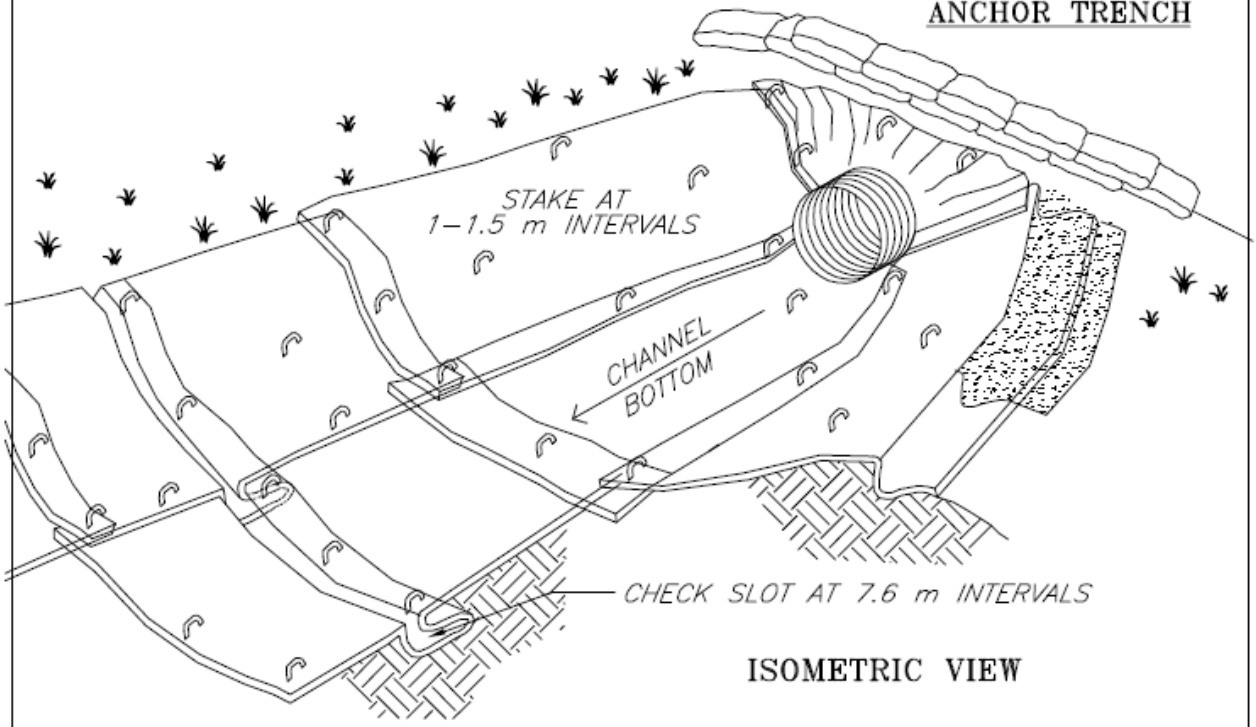
- Assess hydraulic flow conditions and tractive stress on channel
- Assess local soil, weather and growth conditions (favourable/non- favourable) for revegetation (within 3 to 12 months) to allow a determination on use or non-use of RECP as a protective measure. If the revegetation conditions are assessed favourable, the use of RECP can be considered
- Assess suitability of a RECP product using tractive resistance data tested for (i) bare soil, and (ii) vegetated (a specified duration of growth period) condition
- It is noted that tractive resistance data are adopted as selection criteria of RECP and permissible velocity data can be provided for reference.



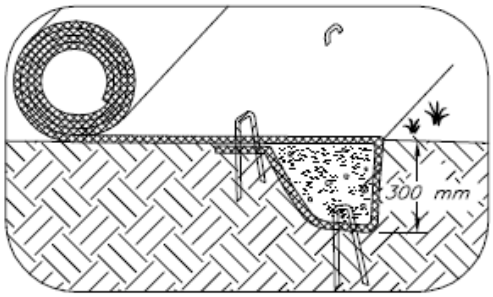
LONGITUDINAL ANCHOR TRENCH



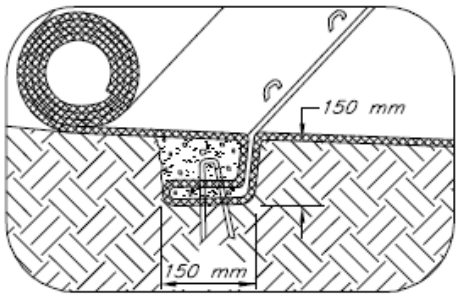
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH



ISOMETRIC VIEW



INITIAL CHANNEL ANCHOR TRENCH



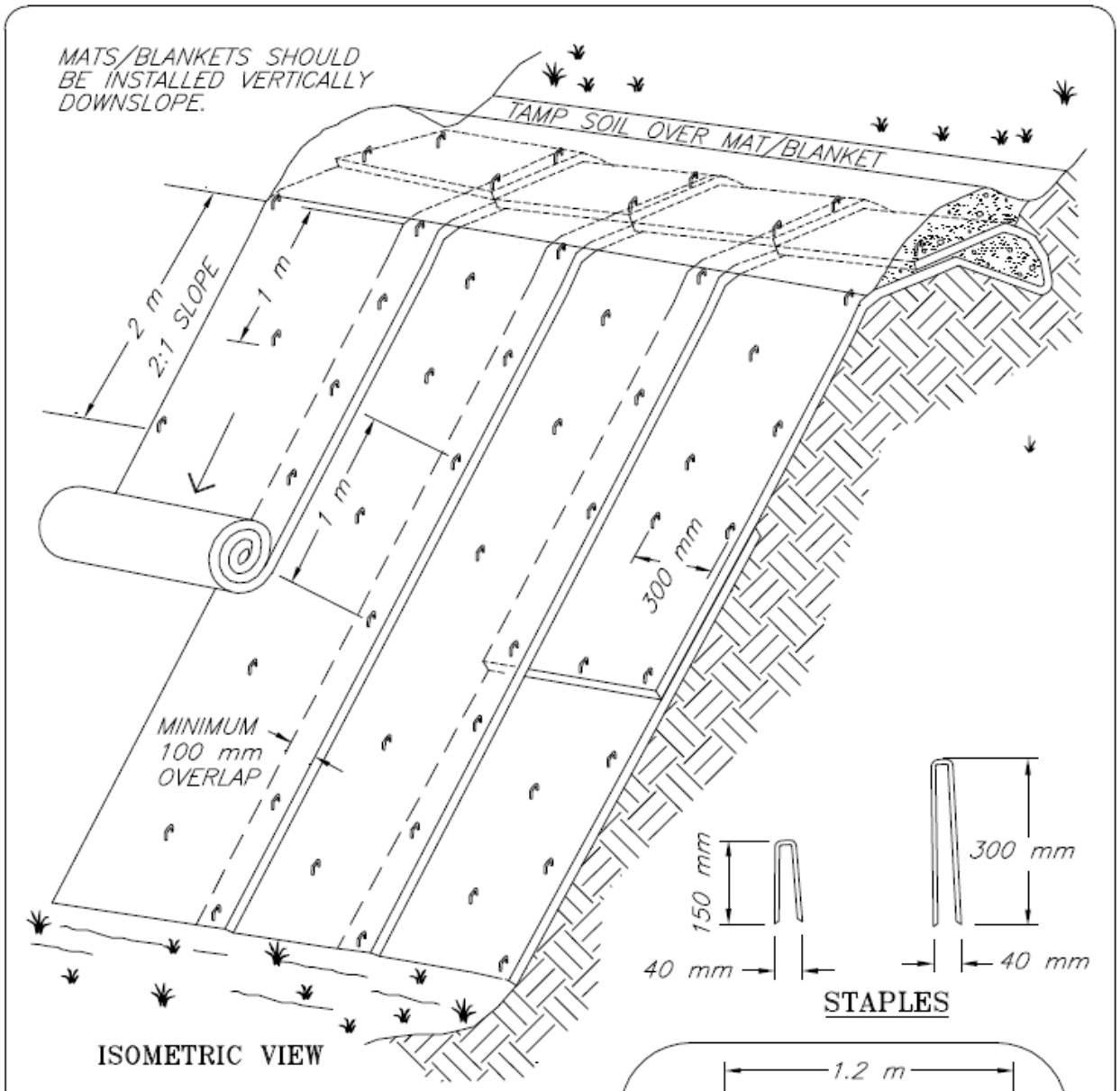
INTERMITTENT CHECK SLOT

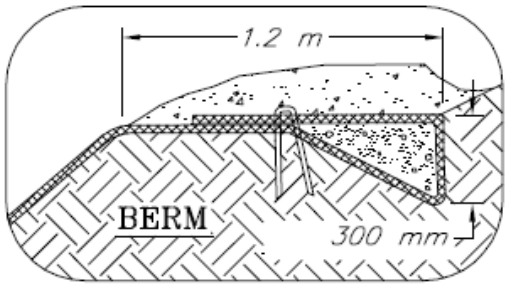
NOTES:

1. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS.
2. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.
3. THIS FIGURE IS PROVIDED FOR GUIDANCE ONLY AND DOES NOT CONSTITUTE A DESIGN. A SITE SPECIFIC DESIGN IS REQUIRED FROM DESIGNER/ENGINEER.

ROLLED EROSION CONTROL PRODUCTS (RECP)

CHANNEL INSTALLATION





NOT TO SCALE

TYPICAL SLOPE SOIL STABLIZATION

NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. CHECK SLOTS, STAKING, STAPLING AND OTHER CONSTRUCTION DETAILS PER MANUFACTURES SPECIFICATIONS.
5. THIS FIGURE IS PROVIDED FOR GUIDANCE ONLY AND DOES NOT CONSTITUTE A DESIGN. A SITE SPECIFIC DESIGN IS REQUIRED FROM DESIGNER/ENGINEER.

ROLLED EROSION CONTROL PRODUCTS (RECP) SLOPE INSTALLATION

EROSION CONTROL BLANKETS AND MATS

EROSION CONTROL

CONSTRUCTION SPECIFICATIONS:

Site Preparation:

- Proper site preparation is essential to ensure complete contact of the protection matting with the soil.
- Grade and shape area of installation.
- Remove all rocks, clods, vegetative or other obstructions so that the installed blankets, or mats will have direct contact with the soil.
- Prepare seedbed by loosening 2-3 inches (50.8-76.2 mm) of topsoil above final grade.
- Incorporate amendments, such as lime and fertilizer, into soil according to soil test and the seeding plan.

Seeding

- Seed area before blanket installation for erosion control and re-vegetation. Seeding after mat installation is often specified for turf reinforcement application. When seeding prior to blanket installation, all check slots and other areas disturbed during installation must be reseeded.
- Where soil filling is specified, seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.

Anchoring:

- U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor mats to the ground surface. Wire staples should be a minimum of 11 gauge. Metal stake pins should be 3/16 inch (4.8 mm) diameter steel with a 1 1/2 inch (38.1 mm) steel washer at the head of the pin. Wire staples and metal stakes should be driven flush to the soil surface. All anchors should be 6-8 inches (0.2-0.5 m) long and have sufficient ground penetration to resist pullout. Longer anchors may be required for loose soils.

Installation on Slopes:

- Begin at the top of the slope and anchor its blanket in a 6 inch (0.2 m) deep x 6 inch (0.2 m) wide trench. Backfill trench and tamp earth firmly.
- Unroll blanket downslope in the direction of the water flow.
- The edges of adjacent parallel rolls must be overlapped 2-3 inches (51-76 mm) and be stapled every 3 feet (0.9 m).
- When blankets must be spliced, place blankets end over end (shingle style) with 6 inch (0.2 m) overlap. Staple through overlapped area, approximately 12 inches (0.3 m) apart.
- Lay blankets loosely and maintain direct contact with the soil - do not stretch.
- Blankets shall be stapled sufficiently to anchor blanket and maintain contact with the soil. Staples shall be placed down the center and staggered with the staples placed along the edges. Steep slopes, 1:1 to 2:1, require 2 staples per square yard. Moderate slopes, 2:1 to 3:1, require 1-2 staples per square yard (1 staple 3' o.c.). Gentle slopes require 1 staple per square yard.

Installation in channels:

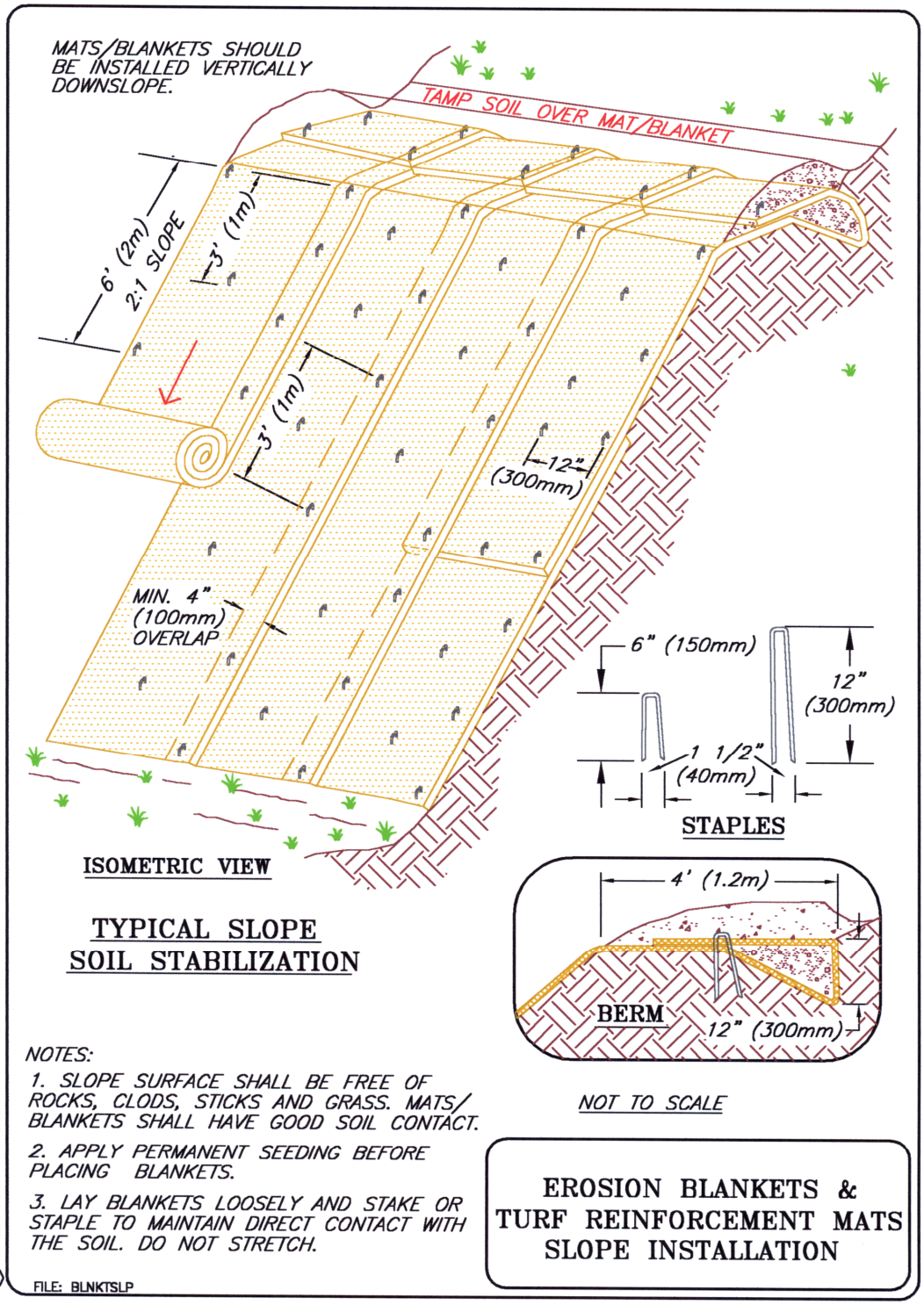
- Dig initial anchor trench 12 inches (0.3 m) deep and 6 inches (0.2 m) wide across the channel at the lower end of the project area.
- Excavate intermittent check slots, 6 inches (0.2 m) deep and 6 inches (0.2 m) wide across the channel at 25-30 foot (7.6-9.1 m) intervals along the channel.
- Cut longitudinal channel anchor slots 4 inches (101 mm) deep and 4 inches (101 mm) wide along each side of the installation to bury edges of matting. Whenever possible extend matting 2-3 inches (51-76 mm) above the crest of channel side slopes.
- Beginning at the downstream end and in the center of the channel, place the initial end of the first roll in the anchor trench and secure with fastening devices at 1 foot (.3 m) intervals. **Note**: matting will initially be upside down in anchor trench.
- In the same manner, position adjacent rolls in anchor trench, overlapping the preceding roll a minimum of 3 inches (7.6 cm).
- Secure these initial ends of mats with anchors at 1 foot (0.3 m) intervals, backfill and compact soil.
- Unroll center strip of matting upstream. Stop at next check slot or terminal anchor trench.
- Unroll adjacent mats upstream in similar fashion, maintaining a 3 inch (76 mm) overlap.
- Fold and secure all rolls of matting snugly into all transverse check slots. Lay mat in the bottom of the slot then fold back against itself. Anchor through both layers of mat at 1 inch (25.4 mm) intervals, then backfill and compact soil. Continue rolling all mat widths upstream to the next check slot or terminal anchor trench.
- Alternate method for noncritical installations: place two rows of anchors on 6 inch (0.2 m) centers at 25-30 feet (7.6-9.1 m) intervals in lieu of excavated check slots.
- Shingle-lap spliced ends by a minimum of 1 foot (0.3 m) with upstream mat on top to prevent uplifting by water or begin new rolls in a check slot. Anchor overlapped area by placing two rows of anchors, 1 foot (0.3 m) apart on 1 foot (0.3 m) intervals.
- Place edges of outside mats in previously excavated longitudinal slots, anchor using prescribed staple pattern, backfill and compact soil.
- Anchor, fill and compact upstream end of mat in a 12 inch (0.3 m) x 6 inch (0.2 m) terminal trench.
- Secure mat to ground surface using U-shaped wire staples geotextile pins or wooden stakes.
- Seed and fill turf reinforcement matting with soil, if specified.

Soil filling if specified for turf reinforcement:

- After seeding, spread and lightly rake 1/2-3/4 inches (12.7-19.1 mm) of fine topsoil into the mat apertures to completely fill mat thickness. Use backside of rake or other flat implement.
- Spread topsoil using lightweight loader, backhoe, or other power equipment. Avoid sharp turns with equipment.
- Do not drive tracked or heavy equipment over mat.
- Avoid any traffic over matting if loose or wet soil conditions exist.
- Use shovels, rakes or brooms for fine grading and touch up.
- Smooth out soil filling, just exposing top netting of matrix.

INSPECTION AND MAINTENANCE:

- All blanket and mats should be inspected periodically following installation.
- Inspect installation after significant rainstorms to check for erosion and undermining. Any failure should be repaired immediately.
- If washout or breakage occurs, re-install the material after repairing the damage to the slope or drainageway.



TYPICAL SLOPE SOIL STABILIZATION

EROSION BLANKETS & TURF REINFORCEMENT MATS SLOPE INSTALLATION

Appendix L Transmission Line Integrated Vegetation Management Plan

ARTEMIS GOLD INC

Blackwater Mine

Transmission Line Integrated Vegetation Management Plan

Table of Contents

List of Tables

List of Figures

Work Instructions

Transmission Line Integrated Vegetation Management Plan

Version	F.1
Replaces	E.1
Creation Date	09/04/2023
Scheduled Review Date	
Review Date	
Document Team Members	
Document Owner:	
Document Approver:	
Related Documents:	
Key Contacts:	
Change Requests:	

Acronyms and Abbreviations

ARR	Annual Reclamation Report
Artemis	Artemis Gold Inc.
BC	British Columbia
BC CDC	British Columbia Conservation Data Centre
BW Gold	BW Gold LTD.
CCCIPC	Cariboo Chilcotin Coast Invasive Plant Committee
CEO	Chief Executive Officer
CM	Construction Manager
COO	Chief Operating Officer
DFO	Department of Fisheries and Oceans Canada
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
EDRR	Early Detection Rapid Response
EM	Environmental Manager
ELoMC	Environmental Life of Mine Committee
EMLI	Ministry of Energy, Mines and Low Carbon Innovation
EMP	Environmental Management Plan
EMPR	Ministry of Energy, Mines and Petroleum Resources
EMS	Environmental Management System
ENV	Ministry of Environment and Climate Change Strategy
EPC	Engineering, Procurement and Construction
FOR	Ministry of Forests
FRPA	*Forest and Range Practices Act*
FSR	Forest Service Road
GM	General Manager
ha	hectares
IAPP	Invasive Alien Plant Program

Indigenous nations	Lhoosk'uz Dené Nation, Ulkatcho First Nation, Nadleh Whut'en First Nation, Saik'uz First Nation, Stellat'en First Nation, and Nazko First Nation (as defined in the Project's Environmental Assessment Certificate #M19-01)
IPMR	Integrated Pest Management Regulation
ISCBC	Invasive Species Council of BC
JAIR or Joint MA/EMA Application	Joint Application Information Requirements for *Mines Act* and *Environmental Management Act* Permits
km	kilometres
L	litre
LDN	Lhoosk'uz Dené Nation
LOO	Licence of Occupation
m	metre
MEM	BC Ministry of Energy and Mines
NFN	Nazko First Nation
NIT	Notice of Intent to Treat
NWFN	Nadleh Whut'en First Nation
OLTC	Occupant Licence to Cut
PFZ	Pesticide Free Zone
the Project	Blackwater Gold Project
QA/QC	Quality assurance / quality control
QP	Qualified Professional
RDBN	Regional District of Bulkley Nechako
RMA	Riparian Management Area
RMZ	Riparian Management Zone
RoW	right-of-way
RRZ	Riparian Reserve Zone
SFN	Saik'uz First Nation
SOP	Standard Operating Procedure
StFN	Stellat'en First Nation
the Act	*Integrated Pest Management Act*

TL	Transmission Line
TL AQDMP	Transmission Line Air Quality and Dust Management Plan
TL CEMP	Transmission Line Construction Environmental Management Plan
TL CRP	Transmission Line Conceptual Reclamation Plan
TL FMSCP	Transmission Line Fuel Management and Spill Control Plan
TL IPD	Transmission Line Initial Project Description
TL IVMP	Transmission Line Integrated Vegetation Management Plan
TL SEPSCP	Transmission Line Surface Erosion Prevention and Sediment Control Plan
TL VAMP	Transmission Line Vegetation and Access Management Plan
UFN	Ulkatcho First Nation
VP	Vice President
WMMP	Wildlife Mitigation and Monitoring Plan

1.0 Project Overview

The Blackwater Gold Project (the Project) is a gold and silver open pit mine located in central British Columbia (BC), approximately 112 kilometres (km) southwest of Vanderhoof, 160 km southwest of Prince George, and 446 km northeast of Vancouver. The Project site is presently accessed via the Kluskus Forest Service Road (FSR), the Kluskus-Ootsa FSR and an exploration access road, which connects to the Kluskus-Ootsa FSR at km 142. Electrical power for the Project will be supplied by a new approximately 135 km and up to 140 m wide corridor, km, 230 kilovolt overland transmission line (TL) that will connect to the BC Hydro grid at the Glenannan substation located near the Endako mine, 65 km west of Vanderhoof. A brief description of the proposed TL component of the Project is as follows:

- From the Glenannan substation to the mine site permit area, the TL will be permitted by way of Licence of Occupation (LOO);
- The TL will be constructed within a cleared right-of-way (RoW) of 40 metre (m) width for standard spans, but up to 50 m width for longer spans in select areas. The TL RoW area is approximately 541 ha for the entire length of 135 km;
- Existing permitted and non-status roads will be used for the purpose of accessing the RoW. New access trails and stream crossings will be located only within the TL cleared RoW;
- Equipment and material laydown areas will also lie within the cleared RoW; and
- The construction workforce will be housed at the Project camp or other independent commercial accommodations in the area.

Overall Project construction is anticipated to take two years. The TL is anticipated to take approximately 14 months to construct. Post-construction, most of the temporary access trails used for construction on the TL RoW will be reclaimed deactivated and/or decommissioned within 3 years except for those required for maintenance. During operation of the TL there will be periodic inspections and maintenance as well as occasional unscheduled power supply interruptions that will require inspection and maintenance/repair activities.

Once commissioned, the TL will support mine development, through operations and mine closure. The mine site is located within the traditional territories of Lhoosk'uz Dené Nation (LDN), Ulkatcho First Nation (UFN), Skin Tyee Nation and Tsilhqot'in Nation. The Kluskus and Kluskus-Ootsa Forest Service Roads (FSRs) and Project TL crosses the Traditional Territories of Nadleh Whut'en First Nation (NWFN), Saik'uz First Nation (SFN), and Stellat'en First Nation (StFN; collectively, the Carrier Sekani First Nations) as well as the Traditional Territories of the Nazko First Nation (NFN), Nee Tahi Buhn Band, Cheslatta Carrier Nation, and Yekooche First Nation (EAO 2019a and 2019b).

Additional details on TL components and activities are presented in Section 3.2 of the TL Initial Project Description (TL IPD; BW Gold 2022).

2.0 Purpose and Objectives

The purpose of the TL Integrated Vegetation Management Plan (TL IVMP) is to document BW Gold's RoW vegetation management plans during construction and operation of the TL.

The objectives of the TL IVMP are to:

- Minimize impacts on native vegetation, ecosystems (riparian, old growth forests), plant species and ecosystems at risk;
- Control vegetation on the RoW during TL operation to protect the public, employee safety, and infrastructure and TL reliability; and
- Prevent and manage invasive plants and noxious weeds.

The TL IVMP addresses the requirements of Section 9.8 and 9.9 of the *Joint Application Information Requirements for* Mines Act *and* Environmental Management Act *Permits* (Joint Application Information Requirements; MEMPR & ENV 2019) and is required for the LOO application, to be issued under the *Land Act*. It also conforms to Section 7(1)(a) of the *Integrated Pest Management Act* (the Act*)* for a pest management plan*.* The TL IVMP takes into consideration the comments received from Indigenous nations during the preparation and review of the *Mines Act* / *Environmental Management Act* permit applications for BW Gold's Major Works.

The TL IVMP is linked to the following Project management plans:

- Transmission Line Conceptual Reclamation Plan (TL CRP);
- Transmission Line Air Quality and Fugitive Dust Management Plan (TL AQDMP).
- Transmission Line Construction Environmental Management Plan (TL CEMP);
- Transmission Line Fuel Management and Spill Control Plan (TL FMSCP);
- Transmission Line Surface Erosion Prevention and Sediment Control Plan (TL SEPSCP);
- Transmission Line Vegetation and Access Management Plan (TL VAMP);
- Transmission Line Wildfire Management Plan; and
- Wildlife Management and Monitoring Plan (WMMP);

A number of standard operating procedures (SOPs) have been prepared to support this TL IVMP and are provided in Appendix A. The SOPs were developed for the Project however are also considered relevant to the construction and operation of the TL.

3.0 Roles and Responsibilities

BW Gold has an obligation to meet previous commitments and delegate responsibilities associated with those commitments to mine personnel and site contractors during all phases of the mine life. A clear understanding of the roles, responsibilities, and level of authority that employees and contractors have when working at offsite infrastructure such as the TL as addressed by this plan, is essential to meet Environmental Management System (EMS) objectives.

Table 3-1 provides an overview of general environmental management responsibilities during TL construction for key positions that will be involved in environmental management. Other positions not specifically listed in Table 3-1 that will provide supporting roles include independent Environmental Monitors, other qualified persons, and Qualified Professionals (QPs).

Table 3-1: Blackwater Gold Roles and Responsibilities

Position	Responsibility
Chief Executive Officer (CEO)	The CEO is responsible for overall Project governance. Reports to the Board.
Chief Operating Officer (COO)	The COO is responsible for engineering and Project development and coordinates with the Mine Manager to ensure overall Project objectives are being managed. Reports to the CEO.
Vice President (VP) Environment & Social Responsibility	The VP is responsible for championing the Environmental Policy Statement and Environmental Management System (EMS), establishing environmental performance targets, and overseeing permitting. Reports to the COO.
General Manager (GM) Development	The GM is responsible for managing Project permitting, the Project's administration services and external entities, and delivering systems and programs that ensure Artemis's values are embraced and supported: Putting People First, Outstanding Corporate Citizenship, High Performance Culture, Rigorous Project Management and Financial Discipline. Reports to the COO.
Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of employees and the public, EMS implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the GM.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. Reports to the GM.
Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering Procurement and Construction contractor, other contractors, the Company, and regulatory agencies, where required. Supports the CM and reports to the Mine Manager.
Departmental Managers	Departmental Managers are responsible for implementation of the EMS relevant to their areas. Report to the Mine Manager.
Indigenous Relations Manager	Indigenous Relations Manager is responsible for Indigenous engagement throughout the life of mine. Also responsible for day-to-day management and communications with Indigenous nations. Reports to the EM.
Community Relations Advisor	Community Relations Advisor is responsible for managing the Community Liaison Committee and Community Feedback Mechanism. Reports to the Mine Manager.
Environmental Monitors	Environmental Monitors (Environmental Coordinators and Technicians) are responsible for tracking and reporting on environmental permit obligations through field-based monitoring programs. Report to the EM.

Position	Responsibility
Aboriginal Group Monitors	Aboriginal Group Monitors are required by Environmental Assessment Certificate #M19-01 Condition 17 and will be responsible for monitoring the Project's potential effects on Indigenous interests. Aboriginal Group Monitors will be involved in adaptive management and follow-up monitoring programs. Report to the EM.
Employees and Contractors	Employees and contractors are trained and are responsible for being aware of permit requirements specific to their roles and responsibilities, including the TL IVMP. Report to the Departmental Managers.
Qualified Professionals and Qualified Persons	Qualified professionals and qualified persons will be retained to review objectives and conduct various aspects of environmental and social monitoring as specified in Environmental and Social Management plans.

BW Gold will employ a qualified person as Environmental Manager (EM) who will ensure that throughout the TL Construction phase, the EMS requirements are established, implemented, and maintained, and that environmental performance is reported to management for review and action. The EM is responsible for retaining the services of qualified persons or QPs with specific scientific or engineering expertise to provide direction and management advice in their areas of specialization. The EM will be supported by a staff of Environmental Monitors that will include Environmental Specialists and Technicians and a consulting team of subject matter experts in the fields of environmental science and engineering.

During the TL construction, the Engineering Procurement and Construction (EPC) contractor and subcontractors will report to the CM. The EPC Contractor will be responsible for ensuring that impacts are minimized, and environmental obligations are met during construction. For non-EPC contractors, who will perform some of the minor works on site, the same reporting structure, requirements, and responsibilities will be established as outlined above. BW Gold will maintain overall responsibility for management of the construction phase of the TL and will therefore be responsible for establishing employment and contract agreements, communicating environmental requirements, and conducting periodic reviews of performance against stated requirements.

The CM is accountable for ensuring that environmental and regulatory commitments/obligations are being met during TL construction. The EM will be responsible for ensuring that construction activities are proceeding in accordance with the objectives of the EMS and associated management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and EPC contractor, other contractors, BW Gold, and regulatory agencies, where required. The EM or designate will have the authority to stop any construction activity that is deemed to pose a risk to the environment; and work will only proceed when the identified risk has been addressed and concerns rectified.

The EM will be supported by the VP of Environment and Social Responsibility in order to provide an effective and integrated approach to environmental management and ensure adherence to corporate environmental standards. The EM will be accountable for implementing the approved management plans and reviewing them periodically for effectiveness.

With respect to the TL IVMP, the Responsible Person will be either the EM or delegated to the Pesticide Applicator Certificate holder (i.e., the RoW management contractor once procured).

Pursuant to Condition 19 of the Environmental Assessment Certificate (EAC) #M19-01, BW Gold has established an Environmental Life of Mine Committee (ELoMC) to facilitate information sharing and provide advice on the development and operation of the Project, and the implementation of EAC conditions, in a coordinated and collaborative manner. Committee members include representatives of the Environmental Assessment Office (EAO), UFN, LDN, NWFN, StFN, SFN, NFN, Ministry of Energy,

Mines and Low Carbon Innovation (EMLI), Ministry of Environment and Climate Change Strategy (ENV) and Ministry of Forests (FOR).

Pursuant to Condition 17 of the EAC #M19-01, Aboriginal Group Monitor and Monitoring Plan, BW Gold will retain or provide funding to retain a monitor for each Indigenous nation defined in the EAC #M19-01 prior to commencing construction of the TL and during the TL's active maintenance activities and decommissioning. The general scope of the monitor's activities will be related to monitoring for potential effects from the Project on Indigenous nations' interests.

The TL EPC contractor roles and responsibilities relating to environmental management, industrial and domestic waste management, and environmental protection are identified below in Table 3-2.

Table 3-2: Transmission Line Construction Contractor Roles and Responsibilities

Role	Responsibility
Contractor Construction Manager (CCM)	The CCM has ultimate responsibility for construction proceedings, including worker and public health and safety and environmental protection. The CCM will ensure the implementation of training programs as well as support the Blackwater Gold Environmental Policy. The CCM will ensure that adequate support and resources are made available for the implementation and maintenance of the Environmental Management System, including the management plan implementation and review. The CCM may, as needed, delegate their duties to Qualified Professional who will report to the BW Gold Construction Manager.
Contractor Construction Superintendent	The Contractor Construction Superintendent will have an administrative responsibility and requirement to act upon the directions, guidance, and support of the CCM. They are resources to the CCM, and have the following responsibilities: • Support the implementation of the Blackwater Gold Environmental Policy; • Ensure that environmental matters are given consideration in pre-planning of construction activities, budgets, training, and operations; and • Ensure that workers under their supervision are made aware of known, or reasonably foreseeable, environmental aspects where they work.
Construction Employees, Contractors, and Subcontractors	Employees have general responsibilities for environmental protection, which include: • Supporting the Blackwater Gold Environmental Policy; • Supporting implementation of Environmental Management Plans; • Cooperating with the Blackwater Environment Monitoring Committee representative(s); • Learning and following environmental best practices and procedures relevant to their work; • Following instructions and directives given by supervisors; • Operating equipment in an environmentally responsible manner to avoid environmental impacts; • If training another worker, ensuring that they are properly completing all required tasks and responsibilities in accordance with environmental best practices and procedures; • Reporting all environmental incidents immediately to their supervisor, who will expedite a response to address the incident; • Participating in mitigating or minimizing harm to the environment should an environmental incident occur; and • Asking for help or information when unsure how to perform a task without compromising social, cultural, archaeological, or environmental values.

4.0 Compliance Obligations, Guidelines, and Best Management Practices

4.1 Legislation

Federal and provincial legislation that may be relevant to TL IVMP includes:

- *Canadian Environmental Protection Act*, 1999;
- *Environmental Assessment Act*;
- *Environmental Management Act*;
  - Hazardous Waste Regulation;
- *Fisheries Act*;
- *Forest Act*;
- *Forest and Range Practices Act*;
  - Health, Safety and Reclamation Code for Mines in BC;
- *Impact Assessment Act*;
- *Integrated Pest Management Act;*
  - Integrated Pest Management Regulation;
  - Invasive Plants Regulation;
- *Land Act*;
- *Migratory Birds Convention Act*;
- *Mines Act*;
- *Pest Products Act*;
  - Provincial Forest Land Use Regulations;
- *Seeds Act*;
- *Species at Risk Act*;
- *Transportation of Dangerous Goods Act;*
- *Weed Control Act*;
  - Weed Control Regulation;
- *Wildfire Act*;
  - Wildfire Regulation; and
- *Wildlife Act*.

4.2 Environmental Assessment Certificate and Decision Statement Conditions

The Project received an EAC #M19-01 on June 21, 2019, under the *2002 Environmental Assessment Act*, and received a Decision Statement on April 15, 2019 under the *Canadian Environmental Assessment Act, 2012*, approving the Project with conditions.

There are no EAC conditions specific to this TL IVMP.

The Project received a federal Decision Statement on April 15, 2019. With respect to vegetation, Condition 6.11 of the Decision Statement requires *"…a follow-up program to verify the accuracy of the environmental assessment as it pertains to adverse environmental effects of the Designated Project on the health of Indigenous Peoples caused by changes in concentrations of contaminants of potential concern in water, soil, vegetation, and wildlife, including fish, and determine the effectiveness of mitigation measures."* Condition 6.11 is addressed by the Country Foods Monitoring Plan (ERM 2022) and is not considered further here.

4.3 Permit Requirements

BW Gold has secured permits to construct the TL. Permits include Licence of Occupation (LOO) for Crown Land #7409823 and #7410296, an Occupant Licence to Cut (OLTC) # L52116, L52117, L52136, LL52137, and L52140. Other authorizations include a Works Permit, Junction Permit, Access Permit and Crossing Permit for works within Crown tenures.

The TL IVMP will support applications for Crown land tenures (e.g., Statutory RoW, LOO) under the *Land Act,* and is also required under the *Forest and Range Practices Act* and the Occupational Health and Safety Regulation.

4.4 Policy, Guidelines and Best Management Practices

Policy, guidelines, best management practices related to invasive plant and vegetation management on the RoW can be found in the following resources:

- Approved Work Practices for Managing Riparian Vegetation (BC Hydro et al. 2003);
- BCTS Windthrow Manual: A Compendium of Information and Tools for Understanding, Predicting and Managing Windthrow on the BC Coast (Zielke et al. 2010);
- Best Practices for Managing Invasive Plants Along Roadsides: A Pocket Guide for British Columbia's Maintenance Contractors (Invasive Species Council of BC [ISCBC] 2019);
- Caribou Chilcotin Invasive Plant Committee Regional Strategic Plan (CCCIPC 2017);
- Develop with Care. Environmental Guidelines for Urban and Rural Development in British Columbia (BC MOE 2014);
- Soil Conservation Planning and Practices in the Quesnel and Vanderhoof Forest Districts (FPB 2010; specifically, Appendix C Timber Harvesting Practices Extension Note #1);
- The Federal Policy on Wetland Conservation (EC 1991);
- Field Guide to Noxious Weeds and Other Selected Invasive Plants of British Columbia (ISCBC 2021);
- Fish-stream Crossing Guidebook, Revised Edition (BC MFLNRO, BC MOE, and DFO 2012);
- Guide to Invasive Plant Prevention Guidelines (Clark 2003);

- Guide to Weeds in British Columbia (BC Ministry of Agriculture 2002);
- Integrated Vegetation Management Plan for BC Hydro Transmission and Distribution Power Line Corridors (BC Hydro 2022);
- Invasive Alien Plant Program (IAPP) Reference Guide (BC Ministry of Forest and Range 2010b);
- Invasive Plant Pest Management Plan for Provincial Public (Crown) Lands in the Southern Interior of British Columbia (BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development 2020);
- Invasive Plant Prevention Guidelines (Clark 2003);
- Invasive Plants Identification Field Guide (Province of BC 2008);
- Invasive Species Strategy for BC ([ISCBC] 2017);
- Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO 2018); and
- Pest Management Plan for Management of Vegetation at BC Hydro Facilities (BC Hydro 2009).

5.0 Training and Awareness

All employees and contractors will receive basic training in vegetation management on their arrival on site as part of the Site Orientation. The purpose of this training is to provide site personnel with a basic level of environmental awareness and an understanding of their obligations. This training will cover measures in place to mitigate effects on vegetation.

Employees or Contractors undertaking vegetation management on the TL RoW will be provided with a copy of the TL IVMP and will receive additional training with respect to the requirements that are outlined in the plan. This targeted training will be provided by the Environment Department to personnel with responsibility for vegetation management activities. It will include training on regulatory requirements, key mitigation measures, and herbicide use/handling. This training will be delivered by means of classroom instruction, toolbox/tailgate meetings or other means as appropriate.

BW Gold will regularly review, and update training and awareness documentation based on changes in training needs and regulatory requirements.

6.0 Baseline Summary

The following sections provide an overview of baseline conditions within the TL RoW; full details can be found in the Consolidated Ecosystem Composition and Plant Species and Ecosystems at Risk Valued Components Effects Assessment (ERM 2017).

6.1 Ecosystem Composition

The TL is within the Nazko Upland Ecosection of the Fraser Plateau in the Sub-Boreal Spruce Biogeoclimatic Zone. Low-elevation valley bottoms are dominated by stands of lodgepole pine. Hybrid white spruce tends to dominate on moist to wet sites below 1,500 m, while subalpine fir and Englemann spruce are dominant above 1,500 m. Lodgepole pine is a major species on dry, fire-prone sites at most elevations. The pine beetle epidemic infested almost all of the lodgepole pine forests within this sub-region. Bio-geoclimatic (BGC) units within the TL include: SBSdk (Dry Cool Sub-Boreal Spruce subzone); SBSdw3 (Stuart Dry Warm Sub-Boreal Spruce variant); SBSmc2 (Babine Moist Cold Sub-

Boreal Spruce variant); SBSmc3 (Kluskus Moist Cold Sub-Boreal Spruce variant); and ESSFmv1 (Nechako Moist Very Cold Engelmann Spruce-Subalpine Fir variant) (Table 6.1-1).

Table 6.1-1: Total Bio-geoclimatic Units within the Transmission Line Right-of-Way

Bio-geoclimatic Unit	Final Right-of-Way[1] (ha)
ESSFmv1	21.8
SBSdk	235.6
SBSdw3	71.3
SBSmc2	72.7
SBSmc3	141.8
Total	**543.2**

Notes:

Total does not include wetlands, lakes, rivers, or ponds.

See Appendix E for Site Series names for each unit.

[1] Includes the proposed new alignment and Stellako Re-route (ERM 2017)

6.2 Plant Species and Ecosystems at Risk

Four blue-listed plant species were identified in wetlands during rare plant surveys conducted in 2013 (ERM 2017). A second rare plant survey was conducted by a qualified botanist in August and September 2017; no rare or listed plant species were recorded during this survey. Based on these surveys, the potential for terrestrial plant species at risk is rated as low. There is no spatial overlap with whitebark pine.

The RoW contains 4 ha of ecosystems at risk (blue- or red-listed; Table 6.2-1; ERM 2017).

Table 6.2-1: Ecosystems at Risk

Bio-geoclimatic Unit	Map Code	Site Series	Site Series Name	Right-of-Way Area (ha)
SBSdk	BW	82	Bluegrass - Slender wheatgrass grassland	0.3
	DS	4	Douglas-fir -Soopolallie- step moss	1.2
	LJ	2	Lodgepole pine - common juniper – Rough-leaved ricegrass	2.5
	SW	81	Saskatoon - Slender wheatgrass	0.4

6.3 Sensitive Ecosystems

Sensitive ecosystems include riparian area, sparsely vegetated area, old growth forest, and traditional plant use habitat.

One hundred twenty-one wetlands are within the TL RoW. Two wetlands are blue-listed and both are proposed to be crossed. Mitigation measures specific to wetlands are addressed in Section 9 of the Wetland Management and Offsetting Plan required by EAC Condition 24. Wetland classes in the area include: wet bogs, fen wetlands, marsh wetlands, swamp wetlands, shallow waters. The wetland hydrological functions include larger wetlands that typically occupy flat areas that are part of historical or small lake / flood plain bottoms with little groundwater input.

6.4 Traditional Use Plant Habitat

A total of 19 berry-producing species were chosen to represent traditional use plants. The traditional use plants identified were selected in consultation with Indigenous nations as part of the consolidated effects assessment completed in 2017 (ERM 2017). The proposed new alignment and Stellako Re-route local study area assessed in the consolidated effects assessment (ERM 2017) contained 248.7 ha of traditional use plant habitat. The calculation of the potential loss and alteration of this habitat as identified in the 2017 consolidated effects assessment (ERM 2017) excluded forestry cut-blocks and road edges. The exclusion was as a result of as consultation with Indigenous nations during the process of realigning the TL indicated there is a preference to collect traditional use plants in non-disturbed areas. The calculation of potential loss and alteration also assumed that Indigenous nations harvest traditional use plants within one kilometre of roads and trails and within undisturbed areas or areas affected by natural disturbances such as forest fires and mountain pine beetle, therefore these areas were not excluded from the assessment.

Table 6.4-1: Berry-producing Plants that Occur in the Project Area

Scientific Name	Common Name
Amelanchier alnifolia	Saskatoon
Arctostaphylos uva-ursi	kinnickinnick
Fragaria virginiana	wild strawberry
Prunus pensylvanica	pin cherry
Ribes glandulosum	skunk currant
Ribes hudsonianum	northern black currant
Ribes lacustre	black gooseberry
Ribes sp.	currant or gooseberry
Ribes triste	red swamp currant
Rubus idaeus	red raspberry
Rubus parviflorus	thimbleberry
Rubus pedatus	five-leaved bramble
Rubus pubescens	dwarf red-raspberry
Shepherdia canadensis	soopolalie

Scientific Name	Common Name
Vaccinium caespitosum	dwarf blueberry
Vaccinium membranaceum	black huckleberry
Vaccinium myrtilloides	velvet-leaved blueberry
Vaccinium scoparium	grouseberry
Viburnum edule	highbush cranberry

6.5 Invasive Plants

Table 6.5-1 presents known invasive plant species within the TL local study area and includes locations and descriptive characteristics related to distribution and density for each occurrence. Surveys were conducted in 2017 as part of the *Consolidated Ecosystem Composition and Plant Species and Ecosystems at Risk Valued Components Effects Assessment* (ERM 2017). Oxeye daisy (*Leucanthemum vulgare*) and yellow hawkweed *(Hieracium pratense*) were encountered along most of the gravel road verges along the Kluskus FSR and other roads including old skid trails. Oxeye daisy was also commonly observed in old, poorly regenerated clearcuts.

Table 6.5-1: Known Invasive Plant Species Occurrences

Common Name	UTM (Zone 10)		Distribution Class	Distribution Description	Density Class	Density Description[1]
	Easting	Northing				
Oxeye Daisy	372166	5986929	7	Continuous uniform occurrence of well-spaced individuals	3	High
Yellow hawkweed	379640	5907428	3	Single patch or clump of a species	1	Low
Leucanthemum vulgare	379639	5907418	2	Few sporadically occurring individuals	1	Low
Yellow hawkweed	382800	5908509	4	Several sporadically occurring individuals	1	Low
Oxeye Daisy	382798	5908505	6	Several well-spaced patches or clumps	1	Low
Yellow hawkweed	398654	5911509	6	Several well-spaced patches or clumps	2	Medium
Oxeye Daisy	379389	5980260	6	Several well-spaced patches or clumps	3	High
Oxeye Daisy	378123	5962962	5	A few patches or clumps of a species	3	High
Oxeye Daisy	361665	5886742	2	Few sporadically occurring individuals	1	Low
Oxeye Daisy	390067	5911820	4	Several sporadically occurring individuals	3	High
Yellow hawkweed	390067	5911820	7	Continuous uniform occurrence of well-spaced individuals	3	High
Orange hawkweed	390236	5911598	2	Few sporadically occurring individuals	1	Low
Yellow hawkweed	390240	5911601	7	Continuous uniform occurrence of well-spaced individuals	3	High
Yellow hawkweed	390331	5911479	7	Continuous uniform occurrence of well-spaced individuals	2	Medium
Oxeye Daisy	390331	5911479	6	Several well-spaced patches or clumps	2	Medium

Notes:

[1]Density description: High = 6-10 plants/m^2
Medium = 2-5 plants/m^2
Low = ≤ 1 plant/m^2

7.0 Mitigation Measures

Mitigation measures that will be implemented are presented in the following sections. Additional mitigation measures associated with herbicide use during TL operation are presented in Section 8.6.

7.1 General Mitigation Measures

General measures that will be implemented to minimize vegetation loss and disturbance during clearing are described in Table 7.1-1.

Table 7.1-1: General Mitigation Measures

Category	Mitigation/Management Measure
Compliance	Coordinate clearing activities with other relevant management plans.
	Conduct vegetation clearing in accordance with the Wildfire Regulation.
	Limit vegetation disturbance to areas within the approved TL RoW.
	Coordinate the timing of work restrictions with TL CEMP Section 13.1 (Fish and Wildlife Restriction Periods). Variances may need to be applied for through Ministry of Forests if activities need to happen outside of the least risk Fish and Wildlife Restriction Periods.
	Prior to commencement of construction, flag and map sensitive features identified during baseline surveys to identify no work zones around these features.
Pre-clearing	Cutting prescriptions for each site will consider best management practices in Soil Conservation Planning and Practices in the Quesnel and Vanderhoof Forest Districts (FPB 2010; specifically, Appendix C Timber Harvesting Practices Extension Note #1).
	Use setbacks as identified by the Environmental Monitor.
	Undertake marking of and salvage of listed plant species in accordance with Section 7.2.
Clearing	Conduct vegetation clearing in accordance with the Fire Danger Class in the Wildfire Regulation and the Wildfire Management Plan.
	Conduct erosion prevention and sediment control processes (TL SEPSCP) to reduce the risk of introduction of noxious weeds and invasive species.
	Conduct vegetation clearing in accordance with the TL Clearing Plan.
	Limit soil disturbance in non-cleared areas.
	In areas requiring clearing only, retain the topsoil and vegetation root mat whenever and wherever possible.
	Conduct clearing around sensitive environmental features in accordance with the relevant SOP (Old growth forest Management SOP, Rare and At-Risk Plant Species Management SOP, Riparian Area Management SOP, Wetland Management SOP).
	In areas with sensitive features where clearing cannot be avoided and soil disturbance is not required (e.g., for road edges, or to create safe setbacks from forest to buildings), use low-disturbance methods and removal techniques that are most appropriate, such as pruning, mowing, girdling, topping, hand-falling, or clearing on frozen ground.
	In areas where only tree removal is required, retain shrub and herbaceous vegetation to encourage a self-sustaining, native shrub community with a minimum height of 1 meter.

Category	Mitigation/Management Measure
	Minimize disturbing areas outside or adjacent to areas targeted for clearing (e.g., minimize the creation of temporary landings, machinery and equipment movement, or extent of grubbing and stripping) as determined by the Construction Manager.
	Avoid damage to residual tree roots or stems as this can increase risk of windthrow and disease.
	Salvage and retain woody debris in accordance with the Coarse Woody Debris Management SOP.
	Maintain clearing dimensions to areas approved by the Project *Mines Act* permit, LOO, and Occupant Licence to Cut.
	To limit the number of mature trees removed, conduct girdling, hinging and/or crown reduction versus total tree removal
	Ensure no machinery enters stream or damages banks within 30 m of watercourses.
	Selectively create wildlife trees where safe, practical, and effective
	Deploy berms, woody debris, and/or other visual barriers on the surface of upland slopes, between rocks and parallel and perpendicular to the slope when undertaking vegetation maintenance along the line to limit the vision of predators down the RoW and facilitate cover and movement for smaller animals.
	Maintain a minimum 30 m riparian management area for the Stellako River.
	Limit soil disturbance, as determined by the supervising QP, through practices such as winter falling and machine work on snow, using low ground pressure machinery, and avoiding clearing during periods of high soil moisture.
Post-Clearing	Minimize soil degradation and erosion by leaving stumps and understory vegetation intact where possible and adhering to the TL SEPSCP and TL CRP.
	Manage fugitive dust on roads in accordance with the Fugitive Dust Management SOP and the trigger action response plan provided in the TL AQDMP.
	A QP will assess new edge areas adjacent to roads, work areas, and the TL for windthrow risk and hazard trees, and if risk levels are too high site-specific measures to reduce risk to an acceptable level will be developed. Measures will be consistent with relevant best management practices in Section 7 of the BCTS Windthrow Manual (Zielke et al. 2010), as determined by the QP.
	Vegetation will be maintained in the TL RoW to a minimum height of one metre from the ground except at the locations of the tower bases, guy anchor wires and along the TL access roads, or where not feasible for safety or other reasons to provide cover for wildlife species, limit line of sight for wolves, and limit access to the RoW.
	Deploy berms, woody debris, and/or other visual barriers in appropriate locations along the line to limit the vision of predators down the RoW and facilitate cover and movement for smaller animals.

Notes:

TL = Transmission Line; RoW = Right-of-Way; SOP = standard operating procedure; TL CEMP = Transmission Line Construction Environmental Management Plan; TL SEPSCP = Transmission Line Surface Erosion Prevention and Sediment Control Plan; TL CEMP = Transmission Line Construction Environmental Management Plan; TL CRP = Transmission Line Conceptual Reclamation Plan; TL AQDMP = Transmission Line Air Quality and Fugitive Dust Management Plan; QP = Qualified Professional; LOO = Licence of Occupation.

7.2 Plant Species and Ecosystems at Risk

If new red- or blue-listed plants or plant communities are identified, or changes to the listed status of known plants and communities occur, the following mitigation measures will be implemented:

- The listed plant species and plant communities will be marked or flagged, mapped, recorded, and provided to the BW Gold EM;
- Salvage listed plant species where practical (by a QP), and re-establish in suitable natural habitats that are undisturbed by Project activities prior to disturbance;
- Avoid use of herbicide sprays within 200 m of listed plants and ecosystems at risk and water, where herbicide application is in compliance with Indigenous nation herbicide policies in their Traditional Territories (see Section 8.5); and
- Reduce the impact of fugitive dust on listed plants and ecosystems at risk through adherence of established no-work-zones and dust control measures.

7.3 Riparian Areas

Riparian areas provide important wildlife habitat, are sensitive to disturbance, and contain vegetation that help stabilize streambanks and reduce floodwater velocity. The TL RoW intersects fish-bearing, potentially fish-bearing, and non-fish-bearing streams.

Riparian areas that can be retained without interference with Limits of Approach (see Section 8.4.1) will be protected using a Riparian Management Area (RMA) approach consistent with *Riparian Management Area Guidebook* (BC MOF 1995). The RMA consists of two parts: A Riparian Reserve Zone (RRZ) and Riparian Management Zone (RMZ). Disturbance will not occur in the RRZ except where access roads cannot avoid stream crossings. The RMZ is established outside the RRZ or adjacent to waterbodies that do not require an RRZ (BC MOF 1995). Table 7.3-1 presents a summary of stream classes and RRZ and RMZ widths for fish-bearing and non-fish bearing streams of varying sizes.

Table 7.3-1: Minimum Riparian Management Area Widths for Stream Classes

Stream Class	Mean Channel Width (m)	Riparian Reserve Zone (RRZ) Width (m)	Riparian Management Zone (RMZ) Width (m)	Total RMA Width (m)
Fish Bearing				
S1 – large river	≥ 100	0	100	100
S1	> 20	50	20	70
S2	> 5 ≤ 20	30	20	50
S3	> 1.5 ≤ 5	20	20	40
S4	≤ 1.5	0	30	30
Non-Fish Bearing				
S5	> 3	0	30	30
S6	≤ 3	0	20	20

Source: BC MOF (1995)

In addition to the general mitigation measures in Table 7.3-1, Appendix A3 provides the Riparian Area Management SOP.

8.0 Right-of-Way Management (Operations)

Tall and fast-growing vegetation in close proximity to TL infrastructure can pose a safety risk and present operational issues. As such, vegetation on the RoW must be controlled to create and maintain the safe and reliable transmission of electricity. This TL IVMP is not intended to be prescriptive but provides the Responsible Person with a "toolkit" from which to select the appropriate management strategies based on final site conditions and experience gained over time.

Vegetation on the RoW will be managed in accordance with EAC Condition 23(l), which states:

> **After the TL is constructed, allowing the vegetation within the TL right of way to grow in order to minimize predator sight lines by maintaining limits of approach and, after vegetation has grown to one meter in height or more, not reducing the height of the plant community to any lower than one metre from ground level, unless the area is required for tower bases, guy anchor points or along existing access roads.**

Legislation cited in the following sections refer to the *Integrated Pest Management Act*, unless otherwise noted, and text boxes in amber are wording from the Act. The Act defines a pest as "an injurious, noxious or troublesome living organism, but does not include a virus, bacteria, fungus or internal parasite that exists on or in humans or animals".

This section is broadly organized as follows:

- Access
- Prevention;
- Species Identification;
- Action Thresholds;
- Treatment Method Selection; and
- Treatment Details (herbicide, mechanical, cultural/natural).

8.1 Access

The RoW would be preferentially accessed from existing forest road intersections or TL roads and trails that are part of the Operational Access Network. The TL VAMP addresses requirements in Condition 23l of the Project's EAC #M19-01 and provides the means by which any access roads that are re-opened for TL maintenance or repair will be decommissioned and revegetated, if required (Section 6.6). Vegetation management associated with the TL IVMP would then be conducted by foot, industry-standard low ground pressure vehicles, or on top of the snow during winter depending on the prescription.

Erosion prevention and sediment control needs associated with any activity described in this TL IVMP will be in accordance with the TL SEPSCP.

8.2 Prevention

58 (2) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following integrated pest management elements;

(a) a description of the program that will be employed to prevent organisms from becoming pests;

The TL IVMP includes prevention measures to deter problem vegetation from becoming established, instead of treating it once established. Examples of possible preventive measures may include:

- **Natural controls –** primarily the establishment of stable, low-growing plant communities over time that out-compete taller growing species.
- **Non-vegetation techniques –** to provide more clearance, such as physical re-contouring of the land, and raising conductor heights to avoid contact with vegetation.

Natural control will be the preferred preventative approach. Clearing (during construction) should target tree species known to grow to a height of issue (see Section 8.3) or other incompatible vegetation. When removing tall vegetation, low lying vegetation will be left undisturbed when possible. If species vigorously re-sprout and cause subsequent issues, other controls may be used to selectively treat hazardous growth.

8.3 Identification of Species

58 (2) (b) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following integrated pest management elements – either:

(i) a description of the program that will be employed to identify pests targeted by the plan, or

(ii) identification of the pests targeted by the plan;

The following types of vegetation are targeted by this TL IVMP and are discussed further in the following sections.

- Target vegetation;
- Hazard trees; and
- Invasive plants and Noxious Weeds.

8.3.1 Target Vegetation

Trees and shrubs that are located on and directly adjacent to the RoW (e.g., a minimum of 12 m offset for side vegetation) and risk growing or falling onto the line or interfering with other activities (i.e., maintenance) are the target of management (see Section 8.4.1 for action thresholds).

8.3.2 Hazard Trees

Trees with increased risk of falling and could damage the TL or pose a risk to humans in the area are hazard trees. Through tree risk assessments, hazard trees are identified and prioritized depending on risk to public and employees, property, and the TL system. Depending on the hazard, the appropriate control will be chosen. A hazard tree assessment will be completed prior to using any roads or worksites and on the RoW after primary mechanical clearing has been completed. Following the initial hazard tree assessments, future assessments will be carried out as part of annual general maintenance inspections along the TL RoW and active roads.

8.3.3 Invasive Plants and Noxious Weeds

Control of noxious weeds and their seeds is regulated by BC's *Weed Control Act*. Noxious weeds are any invasive plant species designated by regulation to be noxious under BC's *Weed Control Act* and Regulations. They can displace native vegetation and reduce wildlife habitat and forage. Invasive plants are non-native or alien to the ecosystem under consideration. Their introduction causes, or is likely to cause, economic or environmental damage, or harm to human health. In BC the term invasive plant is synonymous with invasive alien plant.

Invasive plants and noxious weeds are primarily monitored by regional weed committees and are entered into a database administered by the Province of BC. The TL is in the Nazko sub-region of Cariboo Regional District (CRD) Electoral Area 1. The CCCIPC Regional Strategic Plan (2017) provides direction on invasive plant species of highest management priority for control, inventory, and monitoring in the Cariboo Chilcotin region.

Invasive plants in the Cariboo Chilcotin region are mostly limited to roadways, however, invasive species are not well documented in the sub-region (CCCIPC 2017). Appendix B provides the following priority species information and lists:

- Table B-1 provides provincial priority invasive plant definitions and management objectives;
- Table B-2 lists the provincial priority invasive plant species from the BC Inter-Ministry Invasive Species Working Group (BC IMISWG);
- Table B-3 provides invasive plant priority ranking descriptions for the Cariboo Chilcotin region; and
- Table B-4 lists the priority invasive plant species for the CCCIPC sub-regions.

The provincial priority list identifies Early Detection Rapid Response (EDRR) species (refer to https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/publications/provincial_priority_is_list.pdf updated March 2021). These EDRR species pose a significant threat and are those species that proliferate rapidly and are known to have adverse effects on native plant species. There are currently no EDRR listed species in the Nazko sub-region where the Project is located. The EDRR is regularly reviewed by the Province.

The Inter-Ministry Invasive Species Working Group (IMISWG) has developed the provincial EDRR framework to make decisions on treatment of new invasive plants to the Province. For more information on EDRR, see Invasive Species Early Detection and Rapid Response Plan for BC (BC IMISWG 2014).

8.4 Action (Injury) Thresholds

58 (2) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following integrated pest management elements:

(d) a description of the injury thresholds that will be applied in deciding whether a pesticide treatment is necessary and an explanation of

(i) how the thresholds were chosen, and (ii) how the thresholds will be applied;

8.4.1 Action Threshold Selection

The point at which vegetation control is necessary to ensure employee and public safety and continued infrastructure reliability is the action threshold**.** Specific action thresholds are determined by the Responsible Person through consideration of the following:

- Limit of approach;

- Maximum conductor sag;
- Maximum conductor swing;
- Mature vegetation height;
- Growth rates of target species; and
- Unusual terrain features that may result in a low conductor to ground clearance.

The foundation of action thresholds are clearance limits from power infrastructure, defined by the limits of approach. The minimum limits of approach that will be implemented on the TL are provided in Table 8.4-1. There will be no modification of species that will not grow tall enough to enter limits of approach.

Table 8.4-1: Limits of Approach

Type	Offset
Overhang	• No vegetation overhang
Side	• 12 m (minimum) • 32 m (optimum) • No tree capable of falling on line
Understory	• 5 m (minimum) • 8 m (optimum)

8.4.2 Management Cycles

Vegetation management is conducted on a cyclical basis. The length of the vegetation management cycle will vary depending on final species composition and growth rates. Generally, the cycle ranges from 4 to 12 years. The first management evaluation will be completed 2 years post-construction of the TL, and the cycle frequency for subsequent management will be determined at that time.

A number of other factors help determine the length of the management cycle, in particular, fuel loading. Within 300 m of forested and grassland areas, Section 10 of the provincial *Wildfire Regulation* requires corridor management to prevent any fire from spreading. Therefore, some areas may need to be managed before the target species grow too tall because they create too much biomass when cut.

8.4.3 Timing of Treatment

Once it has been determined that a particular site requires management activity or chemical treatment, other concerns inform the specific timing. For example:

- Forest access may be closed due to fire hazard.
- There may be snow on the ground, preventing treatment.
- There may be closures around riparian areas due to fish windows, or around bird nesting areas during breeding season.

Treatment timing also depends on the control method used, as some treatments are more effective at different stages of the growth cycle. For instance, herbicide treatments are most effective when trees are actively growing and are often best used in combination with other treatment methods. An example of this is the use of herbicides to selectively treat deciduous targets a year or two after specific high-density sites

are mowed or brushed. Ensuring that herbicide applications are as effective as possible will help reduce the need for future herbicide use at a site.

8.5 Treatment Methods

58 (2) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following integrated pest management elements:

(e) pest treatment options including

(i) a description of the pesticide and non-pesticide treatment methods of controlling pests that may be used,

(ii) the rationale for selecting the treatment methods described under subparagraph (i),

(iii) the benefits and limitations of each treatment method described under subparagraph (i), and

(iv) a description of how a decision to use treatment methods will be made.

Integrated vegetation management involves the use of different techniques to control undesirable vegetation, and selection of the appropriate method will vary depending on the situation. It is the responsibility of the Responsible Person to select the most appropriate treatment method(s) based on the situation.

The treatment methods may include:

- Manual and mechanical (physical);
- Cultural (natural);
- Chemical (herbicide) methods; or
- A combination of the above.

Tables 8.5-1 to 8.5-3 present the control methods under each relevant category that may be implemented. Each table includes: a description of the technique, selection criteria for the control method, and benefits and limitations of each control method. Tables 8.5-1 to 8.5-3 are intended to aid the Responsible Person make an informed decision on treatment approach given the situation. Additional detail on treatment methods is provided in Sections 8.6, 8.7, and 8.8.

The Responsible Person must comply with the Indigenous nations herbicide policies for use of herbicide within in their respective Traditional Territories, when determining treatment approach. The TL RoW's spatial overlap with these Traditional Territories is shown on Figure 8.5-1.

Given the risks and potential impacts to human health and indigenous plants and wildlife, the use of pesticides (including herbicides) on LDN Territory requires consent from the LDN Chief and Council (see Appendix D for requirements of the scope work to be completed). The LDN policy also indicates that chemical treatment for invasive plant management will not be considered within 100 m of identified harvesting areas (e.g., berry patches, medicinal plants, or traplines) or 100 m of riparian areas. Apart from LDN (Appendix D), Indigenous groups have communicated to BW Gold that chemical treatment (i.e., herbicide application) is not an acceptable method for the purpose of invasive plant management (see Appendix D for herbicide bans from NWFN, SFN, and StFN).

Table 8.5-1: Manual and Mechanical Treatment Methods[1]

Control Description	Selection Criteria	Benefits	Limitations
Brushing (Slashing)			
Removal method using hand tools to cut stems low. • Can be used in addition to a technique involving cutting taller trees at a taller height, then grinding the stem to prevent re-sprouting, commonly used in riparian areas. • Commonly used on transmission lines and can be combined with herbicides. • Tools include chainsaws or circular brush saws. • Effective when vegetation is likely to die after being cut. • Can extend beyond corridor edge in consultation with landowners.	Used in areas with: • Well-established low-growing plant community • In conjunction with mowing • Difficult terrains with restricted machine access • Other methods are too high risk Not favorable in the following circumstances: • High densities of target vegetation • Where mowing is a suitable alternative • If the area would pose safety risks if vegetation were slashed • High fire risk area or if debris is left will violate the *Wildfire Act*	• Immediate removal of target vegetation while minimally disturbing the low-growing well-suited species. • Permanently control coniferous trees cut below lowest branch. • Herbicides can be used to spot treat broadleaf species in addition to brushing to help prevent re-sprouting from roots or stumps. • Helps protect environmentally sensitive areas or fish bearing habitat since brushing can be done without excessive erosion or stream bed damage. • Beneficial in areas with scattered target vegetation.	• Labor–intensive and hazardous in steep terrain. • Difficult in dense vegetation. • Buildup can increase fire risk • If follow-up with herbicides is not completed, dense growth can occur. • Aesthetics may be of concern due to buildup of slash debris. • Stumps left behind pose safety hazard to people and grazing animals.
Mowing			
Target vegetation cutting using a wheel or track-mounted heavy-duty rotary or flail cutting machines. • To cut target vegetation in the corridor, a tractor or excavator is stocked with the cutting head. • If logging operations are being performed, requirements regulated by Ministry of Forests are to be followed.	Mowing is used where: • Terrain is favorable • Areas with high densities of target trees • Sizes of trees that will have debris levels acceptable by the *Wildfire Act* Mowing should not be used in situations of: • Large diameter target trees when mowing is impractical • Areas of high density low-growing compatible species that are well established with low stem target vegetation densities	• Breaks up vegetation, allowing for easy biodegradation which reduces fuel loading and fire risks. • Growth is inhibited from the spring through late summer through mowing which is considered seasonally effective. • Re-sprouting of unwanted vegetation is limited in areas where ground covers are regenerated fast and abundant.	• Generally, not appropriate for riparian areas. • Can advance more substantial regrowth of deciduous vegetation. • Limited by the environmental terrain like water bodies, stumps, and rocks. • Can cause compaction and rutting damage in moist environments.

[1] Modified from *BC Hydro's Integrated Vegetation Management Plan for Transmission and Distribution Power Line Corridors* (BC Hydro 2022).

Control Description	Selection Criteria	Benefits	Limitations
	• Areas with rocks posing risk to cutting heads • Developed or busy public use areas due to flying debris • Where stumps create accessibility issues • Areas where rutting and soil compaction and damage can be caused, like boggy or wet areas • On hazardous slopes or in riparian areas	• In areas where little beneficial vegetation exists, all vegetation is cut to the ground which can create room for beneficial vegetation to grow. • Biodiversity of the existing low ground cover can remain when using selective mowing for target vegetation. • Fast and economical removal of target vegetation. • The technique and work progression are plainly visible • Less hazardous when using machines compared to hand-held tools.	• Can leave ragged stumps which can cause safety issues and is unsightly, specific to mowing with mulches the brush. • Create ruts, degrade the ground, and track marks. • Not used in areas of cultural or archeological significance. • Not used in areas with slope steeper than 30%.
Grooming			
Uses excavators or bulldozing equipment to remove vegetation through a mechanical grubbing and grading technique. • Exposed soil is then seeded with low growing vegetation to help prevent the growth of target vegetation. • Used in areas of high-density target vegetation to transform into low maintenance environments. • Grooming removes stumps. • Can be used in localized areas where stumps are mechanically removed where herbicides cannot be used. • Used in combination with other methods.	Used in the following situations to: • Clear land for sustainable and manageable grazing or agricultural use • To re-shape the land to increase the clearance to the conductor • Shift vegetation species in areas of high-density target vegetation to low-growing vegetation • Respond to local government agency and private landowner's requests • Conserve road access Not recommended when: • Low stem densities of target vegetation are low and desirable species, also low growing is high • In rocky areas that could cause damage to clearing equipment • In wet or boggy areas that can cause rutting and soil compaction	• Site is cleared of stumps and vegetation preparing land for reseeding and creating an environment filled with desirable vegetation or compatible use. • Compatible land base is created and benefits landowners. • Lessened ongoing maintenance required under the power lines for safe operation. • Less hazardous to operator when compared to handheld tools.	• Environment must be suitable for economic agricultural use or grazing if site is to be converted. • Temporary measure that exposes soil surface to. unwanted vegetation species • Certain species are not removed (root-suckering species and re-sprouting species). • Exposed soil risked erosion.

Control Description	Selection Criteria	Benefits	Limitations
	• Slopes are present • In riparian areas • Culturally sensitive archaeological areas that risk being disturbed		
Girdling			
Involves cutting one or more strips of bark down to the sapwood from locations around the tree trunk using a specialized cutting tool, chain, or saw. • Limited to single-stemmed, mainly deciduous trees. • After bark removal, the tree dies. • Only gridling and herbicide application kills deciduous species. Girdle 1/3 of tallest deciduous trees throughout the site with priority given to the tallest and those clumps which provide the best natural regeneration	• Used in riparian and environmentally sensitive areas. • Used to control scattered individuals birch, willow, and alder species. Not used on: • Trees with small diameter • Balsam poplar, black cottonwood, and aspen trees with small diameter because these species are known to re-sprout • Environments where the limits of approach are reached in two growing seasons by target vegetation, unless the girdling and tall brushing techniques is used • High stem densities of over 15,000 per hectare due to practicality and the fire hazard • Where trees could fail and lead to injury or property damage • On conifer trees except when part of a riparian prescription or if it is retained as a wildlife tree • On maple species with more than five stems	• Useful in riparian areas or unstable slopes due to the promotion of retention of vegetation cover and the increase of site stability because of root structure retention. • Not limited by difficult terrain. • Can be performed on a tree-by-tree basis. • Strengthens low-growing forage vegetation for wildlife and habitat for small mammals and birds. • No danger to wildlife. • Over story of deciduous vegetation is naturally shed over the years.	• Not used over dense brush vegetation or large areas. • Work needs to be closely inspected and completed carefully to ensure sufficient width and depth of girdles to be maintained. • Vegetation with thick bark on large stems is not effectively managed with tools. • Additional hand tool work is needed if live branches are present 1.3 m above ground. • Depending on the vegetation, the dead trees stay in standing for 2-3 years and are unpleasant to view in highly visible areas. • Hand tools use might be hazardous to employees. • Trees blown down may pose safety risk. • Requires experienced employees.

Control Description	Selection Criteria	Benefits	Limitations
Pruning			
The technique of branches or limbs removal to guide and control tree growth away from transmission lines. Selectively crown reduce (by up to 1/2) all coniferous trees, >20 m tall. • Typically used when full tree removal is not appropriate.	Used in the following situations: • Compared to tree removal, pruning is more cost-effective • Tree-removal opposition and no legal RoW agreement • Main trunk out of the RoW but the branches grow towards the conductors from the side • Where trees are needed to protect the riparian areas or for habitat • Where a healthy vegetated edge only beside the power lines and only needs side pruning to conserve clearance Should not be used: • Where trunks are too close to transmission lines to be left in place • Where trees are unhealthy and need to be removed or replaced	• The trees can still provide multiple functions including habitat since it is not removed. • This technique helps to manipulate the growing direction of branches, so they do not grow in the transmission line direction. • Minimization of unfavorable effects on tree health, • Pruning can minimize adverse effects on tree health, and over a period, decrease the clearing workload and safety risk from trees that are unhealthy. • Wildlife habitat is provided by pruned trees.	• Usually costs more than removal. • Pruning must be done by a Certified Utility Arborist. • If pruned incorrectly, trees can be seriously damaged and cause hazardous situations. • Trees still pose a hazard potential since they are left in place.

Table 8.5-2: Cultural (Natural) Control Treatment Methods [2]

Control Description	Selection Criteria	Benefits	Limitations
Precludes growth of target vegetation through use of managed landscapes including crops, parks, and pastures. • Corridor segments converted to crops, agriculture, and rangeland or more compatible vegetation that is low growing and are all forms of cultural control from tree stands of issue. • Equipment may include seed drills, belly grinders, and cyclone spreaders to establish grassy areas. • Native low-growing plant species, in some areas, may be managed and encouraged to grow and adapt to certain sites. This helps to overpower or eradicate the target species.	• Manual, mechanical, and chemical techniques used to control target species and enhance desired species are used when plant competition is available option on transmission lines. The species to replace are carefully selected for areas to be converted to culturally managed sites. Preferential method when: • Replanting of low vegetation is beneficial usually in small publicly exposed areas, or shelterbelts or riparian habitat • Area is suitable to convert to managed sites and is consistent with land uses in next to the corridor • Compatible land use is managed by groups or other individuals Not recommend where: • Challenging to perpetuate • Seeding may be costly or hard to source	• Transmission corridor management allows for multiple uses compatible with the system and the resources provide value over time. • When the growth of target vegetation is successfully suppressed, creating easier maintenance and less disturbances to the flow of power. • Can be successful in complex riparian areas or unstable slope environments where bioengineering can be used. • Lower long-term cost.	• Insufficient availability of sites for conversion. • High cost and or the lack of people/peoples to manage the site. • It is difficult to manage the site to promote desirable vegetation and deter target vegetation.

[2] Modified from *BC Hydro's Integrated Vegetation Management Plan for Transmission and Distribution Power Line Corridors* (BC Hydro 2022).

Table 8.5-3: Chemical (Herbicide) Control Methods[3]

Control Description	Selection Criteria	Benefits	Limitations
Cut Surface			
Tree trunks are cut as close to the ground as possible and the stump is sprayed with herbicides to prevent re-sprouting. • Used in combination with tree removal or brushing in deciduous tree stands. • Directional cutting to reduce impact on surrounding non-target species.	• Not recommended by UFN, LDN, NWFN, or StFN unless determined by a QP that chemical treatment is the only option. • Used in areas where basal bark treatment is not recommended like where standing dead trees are not desired on the landscape. • The treatment of cutting surfaces is extremely effective on species that do not sprout from their roots. • Not recommended when thick clumps of hard-to control species in a location where control is required.	• Treatment can be used in any terrain. • Limited soil disturbance for numerous herbicide treatments. • No dead foliage is left standing which is beneficial in highly visible sites. • Low risk of employees or public individuals to herbicide exposure due to the nature of treatment. • Limited herbicide use on the cut surface so impact on the ecosystem, wildlife, and fish is negligible. • The canopy is removed, but the low forage for wildlife is strengthened. • Typically more cost effective than manual or cultural treatment.	• If herbicide treatment is applied incorrectly the treatment may be ineffective and have to be repeated. • The forage and cover are reduced in the short term. • The labor is rigorous and is not cost-effective for stands of trees that are dense. • Requires an Industrial Vegetation and Noxious Weed Pesticide Application Certificate.
Basal Bark			
Basal bark treatment involves spreading herbicide on the bark of an unwanted tree. • The herbicide is absorbed into layers of the bark and spreads through the tree and roots which helps to prevent sprouting	• Not recommended by UFN, LDN, NWFN, or StFN unless determined by a QP that chemical treatment is the only option. • Herbicides are applied with a hand-held sprayer or a small backpack. • Best on deciduous trees that are under 4 m tall. • Standing dead stems if present may be a fire hazard.	• Not as laborious as grinding, or manual brushing. • Can be used in areas that are difficult to access or remote. • Only treats target vegetation which is desirable in areas with low densities of target vegetation. • Limited soil disturbance for numerous herbicide treatments.	• Dead foliage may be unpleasant. • Surviving steams may continue to grow after treatment on areas of low clearance. • Requires an Industrial Vegetation and Noxious Weed Pesticide Application Certificate.

[3] Modified from *BC Hydro's Integrated Vegetation Management Plan for Transmission and Distribution Power Line Corridors* (BC Hydro 2022).

Control Description	Selection Criteria	Benefits	Limitations
	Not recommended when: • May not be successful on dense tree stands because of effectiveness and cost	• Allows the growth of low-growing vegetation since it removes the canopy over three years. • Spray drift is reduced. • Negligible risk for employees or public to be exposed to herbicides. • Per hectare of land little product is used. • Typically more cost effective than manual or cultural treatment.	
Backpack Foliar			
Herbicide application using pressurized, low-volume, manually-operated backpack.	• Not recommended by UFN, LDN, NWFN, or StFN unless determined by a QP that chemical treatment is the only option. • Area needs terrain that allows for good footing to help lower risk of applicators falling. • Allows for better coverage and decreases overreaching potential when vegetation is below 1.5 m tall. • Commonly used to manage re-sprouting dense target vegetation after 1 to 2 years since the area was slashed or mowed. • Mainly used for invasive and noxious weed control. Not recommended for: • Control where the canopy is over 1.5 m tall • Large areas	• Efficiently manages re-sprouting of highly dense target vegetation and effectively manages noxious weeds. • Some herbicides contain a residual element and can have the potential to control species for more than one year, to reduce the frequency of treatment. • Ability to adjust application dosages and rates as it targets specific vegetation. • Limited soil disturbance for numerous herbicide treatments. • Typically, more cost effective than manual or cultural treatment.	• Depending on the direction of the wind and topography or the area, buffer zones may be needed to protect Pesticide Free Zones (PFZs). • Limits height of target vegetation that can be treated. • Care is necessary when treating areas to avoid overspray to desirable vegetation. • A decrease in short-term vegetation foraging species can occur. • Requires an Industrial Vegetation and Noxious Weed Pesticide Application Certificate.

Control Description	Selection Criteria	Benefits	Limitations
Mechanized Foliar			
Herbicide application using a wick sprayer, fixed nozzle, or boom-directed nozzle attached to an ATV.	• Not recommended by UFN, LDN, NWFN, or StFN unless determined by a QP that chemical treatment is the only option. • Beneficial in areas that have been hand-slashed or mowed in the past to reduce the chances of unwanted vegetation re-sprouting and is used in areas where the majority of vegetation is not desirable. • Suggested use in areas where there is uniform height in target vegetation to minimize spray runoff to the ground. • Exceptional for controlling invasive and noxious weeds. Not recommended for: • Riparian or other sensitive areas	• Logical method when managing high-density unwanted vegetation that has re-sprouted. • Application rate and dosage setting are adjustable and it targets specific unwanted vegetation. • The well-defined droplets produced result in acceptable coverage of vegetation with minimal runoff due to the nozzles used. • Typically, more cost effective than manual or cultural treatment.	• Method is not as particular as backpack method and more potential for drift. • Depending on the direction of the wind and topography or the area, buffer zones may be needed to protect PFZs. • Care is needed when treating areas to avoid the possible accidental treatment of desirable vegetation. • A decrease in short-term vegetation foraging species can occur. • Limited by terrain and cannot operate effectively in wet areas. • Can cause deterioration of surface in the RoW, rutting and track mark creation. • Limited to slopes less than 30% • Requires an Industrial Vegetation and Noxious Weed Pesticide Application Certificate. • Herbicide use is limited around water and PFZs must be applied. • Minimal products can be used around water and applications must comply with Ministry of Forests Invasive Plant Management Plan for Provincial Crown Lands in the Southern Interior of BC (some sections of the TL are in the Northern portion of the Plant Management Plan as well). • Herbicide treatment may need more than one treatment, depending on the infestation size, due to soil seed bank.

Control Description	Selection Criteria	Benefits	Limitations
Injection Techniques			
Herbicide injection into the target tree stem or stump which is slowly released to the sapwood. • Include syringe application, mechanical injection, and hack-and-squirt based on authorization on the herbicide product label. • Invasive species like Japanese knotweed are effectively killed through the use of syringe applicators that inject herbicide into the stems. • The method of hack-and-squirt involves cutting through the thick bark into the sapwood with an axe, machete, or hatchet and squirting herbicides into the cut using a bottle.	• Not recommended by UFN, LDN, NWFN, or StFN unless determined by a QP that chemical treatment is the only option. • Used when cut method is not possible. • Advantageous on stumps that are re-sprouting if the capsules are put into live tissue. • Used in limited access areas and in riparian areas where applicable. • Trees with a larger diameter are effectively controlled by hack and squirt but it is not by controlled injection. Not recommended for use when: • There is a risk safety and energy flow due to the proximity to the transmission line because the vegetation does not promptly die • Not successful on aspen poplar or bigleaf maple	• Unlikely to injure surrounding species and are highly selective. • Effective on species like red alder, and larger vegetation that cannot be successfully managed with basic practices. • Effective on noxious weeds with a wide diameter. • Not limited by terrain. • Easy to learn and safe. • Use of herbicide is minimal and enclosed which creates very minimal potential for public and worker exposure. • The possibility of environmental contamination is extremely minor. • Not limited by time of the year. • Permits low-growing forage but removes higher cover. • Limited soil disturbance for numerous herbicide treatments. • Typically, more cost effective than manual or cultural treatment.	• Dead foliage is unsightly in visible areas. • Capsules do not biodegrade. • More risk of vegetation close to lines causing security to be jeopardized because the vegetation can grow after treatment, and it is possible to miss treatment of single trees. • Can be labor intensive. • Capsules used are not easily available. • Requires an Industrial Vegetation and Noxious Weed Pesticide Application Certificate.

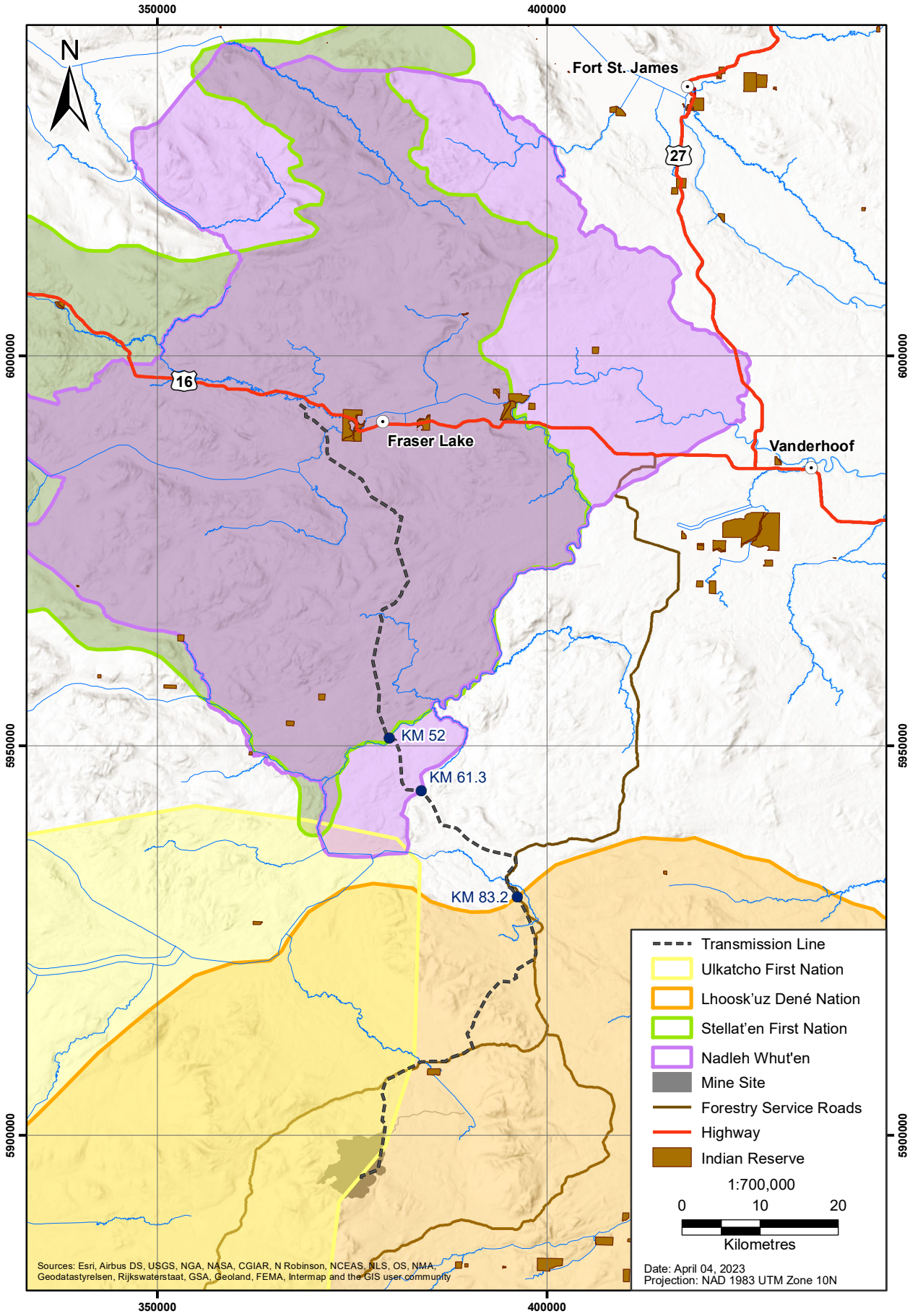


Figure 8.5-1: Lhoosk'uz Dené Nation, Ulkatcho First Nation, Stellat'en First Nation and Nadleh Whut'en First Nation Traditional Territories

8.6 Herbicide Control

Indigenous groups have communicated to BW Gold that herbicide application is not an acceptable method to manage invasive plants (see Appendix D for herbicide bans from NWFN, SFN, and StFN). BW Gold is also committed to avoiding the use of herbicides within the UFN Territory. Herbicide use would only be considered as a treatment option if a QP has identified that chemical treatment may be the only effective invasive plant management option available for an infestation (i.e., all other treatment options have proven ineffective). Prior to herbicide use, BW Gold will look to Indigenous nations for approval of limited herbicide use for the specific infestation in their Traditional Territory.

In addition, in consultation with BW Gold, the Responsible Person would develop a treatment plan detailing the requirements listed in the LDN herbicide use policy (for approval from the LDN Chief and Council) as well as mitigation measures for spray drift, run off, herbicide carryover, damage to non-target species, and operator error. The herbicide selection and application methods will be informed by consultation with Indigenous nations and CCCIPC as well as site conditions, target species and treatment objectives. Herbicide application methods will comply with BC's *Integrated Pest Management Act* and be documented using the BC MFLNRO Invasive Plant Chemical & Mechanical Treatment Record (BC MOFR 2010b). Pesticides will be purchased from a licensed vendor and will only be applied by those with training and certification.

This section covers the responsible use and handling of herbicides in accordance with Section 58 of the Integrated Pest Management Regulation (IPMR).

8.6.1 Licensing

Most herbicide use at BW Gold facilities will be undertaken by contractors. Any contractor or employee that provides this service to BW must have a valid BC Pest Control Service Licence, and each supervising applicator must have a valid BC Pesticide Applicator Certificate in the Industrial Vegetation and Noxious Weed Category. Under BC's *Pesticide Control Act* Regulation, a certified pesticide applicator can supervise up to four uncertified assistants, provided the assistants are within continuous auditory or visual range at all times while applying pesticides. Individuals must carry proof of their applicator certification with them when applying pesticides for inspection purposes.

8.6.2 Herbicide Transportation

> *58 (3) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following operational information:*
>
> *(a) A description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including a description of the following procedures:*
>
> *(i) procedures for safely transporting pesticides;*

Table 8.6-1 presents the minimum procedures that BW Gold employees or contractors will adhere to when transporting herbicide for use on the RoW.

Table 8.6-1: Herbicide Transport Procedures

Type	Procedure
Transportation	When in transport, the herbicide is to be properly secured to prevent spills and contamination of other items. The compartment shall be separate from food and drinking water, safety gear, spill containment and people.
	Herbicides are to be kept in the original containers with the original packaging and labelling attached with the pesticide registration number, trade name, active ingredient concentration, warning symbol, and name.
	Follow the *Transportation of Dangerous Goods Act* federal and provincial transport requirements that are applicable, including labels, placards, markings, and documentation (including material safety data sheet). More than 5,000 L of spray equipment liquid is not allowed to transport on public roads.
	Prior to transport inspect containers for defects. Any defective packages are to be transferred to empty pesticide containers of the same type, or the defective containers are secured in secondary containment.
	During transport, the herbicide will not be packed with food, feed, or clothing; vehicle will be locked when unattended, herbicide will be in the passenger section of a vehicle.
	The transport vehicle will be equipped with a first aid kit, fire extinguisher, spill contingency plan and kit, and that the operator has been trained in spill response.

8.6.3 Herbicide Storage

58 (3) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following operational information:

(a) a description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including a description of the following procedures:

(ii) procedures for safely storing pesticides;

BW Gold will procure the services of certified herbicide applicators who will transport product to the TL RoW when required (i.e., it will not be permanently stored onsite). The temporary storage procedures while on the TL RoW are provided in Table 8.6-2.

Table 8.6-2: Herbicide Storage Requirements

Type	Procedure
Storage	Store in original containers and original packaging, or proper containers with the trade name, active ingredient name and concentration, and pesticide registration number affixed.
	Keep in locked storage when unattended, properly ventilated, not used for food storage or water storage intended for consumption of humans and animals, only accessible by authorized individuals.
	A logbook is kept of herbicides, current product labels, a copy of the *Occupational Health & Safety Regulation* from WorkSafe BC, and Material Safety Data Sheets are kept in the vehicle.
	The storage will be locked when left unattended and used by persons authorized to do so.

Type	Procedure
	The storage will have a notice stating "warning - chemical storage - authorized persons only".
	The vehicle will be equipped with necessary spill equipment, first aid kits, and appropriate MSDS sheets.

8.6.4 Mixing/Loading & Applying Herbicides

58 (3) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following operational information:

(a) A description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including a description of the following procedures:

(iii) procedures for safely mixing, loading, and applying pesticides;

The minimum procedures that will be implemented for herbicide mixing/loading and application are provided in Table 8.6-3 as per Pesticide Regulations and Safety **(**pesticide_regulations_and_safety_bc_vegetable_production_guide.pdf (gov.bc.ca))

Table 8.6-3: Herbicide Mixing/Loading and Application Procedures

Type	Procedure
Mixing and Loading	Dedicated containers used in the preparation, mix, and or applying herbicide process are not to be washed or submerged in a water body.
	An eye wash station, appropriate Personal Protection Equipment, and spill kit will be available for during mixing and loading.
	To avoid accidental spills the following will be completed: A minimum 15 cm gap is to be maintained between herbicide and equipment when drawing water from a water body or irrigation system into the herbicide container; water will not be drawn directly from a water body into a herbicide container; loading will not be conducted within 30.5 m of a water body or irrigation system; when possible water will be drawn from a dedicated clean water tank at the storage facility
	Mixing of herbicides is to take place in well ventilated areas outdoors, with low wind (standing upwind), and away from people, livestock, wells, and waterbodies.
	Only Certified Pesticide Applicators to mix and load herbicides while using the appropriate protective equipment, using the label or production guide rate, calibrated application equipment. A sharp knife will be used to open a paper herbicide bag.
	Read the product label and associated Material Safety Data Sheets and follow all safety precautions when mixing a product and measure accurately and hold container below eye level when measuring or adding herbicide into the spray equipment Triple rinse herbicide containers as soon as they are empty. Rinse measuring and mixing equipment. Put rinse water into the sprayer. Use clean water for rinsing (pH of the water should be from 5.0 to 7.0) and prevent overflow.

Type	Procedure
	No application of herbicides within 10 m of community watershed water bodies, 30 m downslope of watersheds, and 100 m upslope of watershed intakes." to "No application of herbicides within 30.5 m of community watershed water bodies, 30.5 m downslope of watersheds, and 100 m upslope of watershed intakes. Tanks containing herbicide will not be left unattended.
Application	Follow and not exceed the area of treatment areas noted in the Notice of Intent to Treat to protect agricultural and domestic water sources, native (desirable) vegetation, and soil used for agricultural crop production for their intended use through working precautions.
Records	Keep records to show how requirements are being met.
	Apply in a manner to prevent exposure to unprotected human, wildlife, or domestic animals.
	When any changes to the original treatment plan occur, record and/or map the changes.
	Use the most appropriate application technique for the task.
	Application personnel possess required maps and prescriptions.
	Minimize drift by: • not spraying in strong winds or dead calm. There is usually less wind in the early morning and late evening. • not spraying when temperatures are greater than 30oC. • using boom sprayers with as low pressure as possible, the correct nozzles, large volumes of water, and setting the boom as near to the ground as possible to still get uniform coverage. • using drift guard or other specialty nozzles
	No application of herbicides within 30.5 m of community watershed water bodies, 30.5 m downslope of watersheds, and 100 m upslope of watershed intakes.
	Following application of herbicides: • Clean equipment away from water supplies. • Remove and clean protective clothing and equipment. • Record application

8.6.5 Herbicide Disposal

58 (3) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following operational information:

(a) A description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including a description of the following procedures:

(iv) procedures for the safe disposal of empty pesticide containers and unused pesticides;

The *Environmental Management Act* and Hazardous Waste Regulation govern the disposal of herbicide waste. All herbicide application activities will be planned to limit waste. Storing for reuses and proper disposal methods will be used if leftovers are present.

The contractor (certified herbicide applicator) will include disposal methods in a written application statement that will include the following:

- Empty plastic, metal, or glass containers are to be rinsed three times prior to disposal. The containers and sprayers are to be rinsed 30.5 m away from any well or water body.
- Non-recyclable containers are to be broken down or punctured to avoid reuse and then disposed of at an appropriate waste disposal facility.

8.6.6 Spill Response Plan

> *58 (3) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following operational information:*
>
> *(a) A description of the methods of handling, preparing, mixing, applying and otherwise using pesticides that will be employed under the plan including a description of the following procedures:*
>
> *(v) procedures for responding to pesticide spills;*

The Contractor will be expected to have a spill kit on site during herbicide application. At a minimum, the Contractor will do the following should an herbicide spill does occur:

- Stop the flow of the herbicide and contain the spill if safe to do so;
- Limit access to the area and protect people and wildlife from exposure;
- Appropriate protective equipment will be put on including respirators, eye protection, and gloves;
- Report the spill to the EM, who would in turn report to the Provincial Emergency Program as per the Spill Reporting Regulation, if necessary; and
- Clean up the site in accordance with the nature of the spill and the TL FMSCP

8.6.7 Pre-treatment Inspection Procedures

> *58 (3) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following operational information:*
>
> *(b) a description of the environmental protection strategies and procedures that will be followed under the plan, including a description of the following strategies and procedures:*
>
> *(iv) pre-treatment inspection procedures for identifying treatment area boundaries;*

Pre-treatment inspections will be undertaken prior to management using herbicide to determine environmentally sensitive features that require specific protection within the treatment area. In addition, BW Gold will undertake focused engagement with Indigenous groups and stakeholders that may be impacted by the use of herbicides on the RoW including Crown land managers and adjacent private landowners.

Prior to initiating the works, any specific environmental concerns are discussed with the Contractor and the boundary is flagged. Before applications begin the following topics will be reviewed with each individual (by the Certificate holder) who will be using herbicide:

- Boundaries of the treatment area;
- Requirements for personal protection equipment;
- The Spill Response Plan;
- Herbicide use procedures required to protect human health and the environment;

- Target species to be controlled, the desirable species to be protected during treatments, and how to identify these plants/trees; and
- Detailed map showing the proposed treatment areas and Pesticide Free Zones (PFZs) in the treatment area.

8.6.8 Monitoring

> *58 (2) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following integrated pest management elements:*
>
> *(c) a description of the monitoring program that will be employed before or during the pesticide use for assessing pest populations, environmental conditions and damage caused by pests, which program must include a description of*
>
> *(i) the monitoring methods,*
>
> *(ii) the frequency of monitoring, and*
>
> *(iii) the data that will be collected;*

Pre-treatment evaluation will utilize ground and/or aerial inspection of the RoW for areas requiring vegetation management. The RoW will be monitored on a cycle, determined by the final species composition, projected growth rates, and clearance requirements. It is anticipated the RoW will be inspected every 3 to 5 years.

The following information may be collected during this evaluation and will be used to define the treatment plan:

- Access road conditions that may affect the types of equipment that can be brought on site.
- Presence of sensitive ecosystems that may contain rare and endangered species and/or riparian ecosystems.
- Any imminent threats to infrastructure or safety.
- Tree heights and proximity to approach limits.
- Species and functional group (deciduous, conifer, root-suckering, resprouting, low-growing, etc.).
- Species distribution (e.g., clumped, scattered).
- Tree diameter
- Occurrence or proximity of low-growing native forage or ground cover species (i.e., species that will survive the treatment and naturally spread to revegetate the intended area).
- Occurrence and intensity of re-sprouting or suckering.
- Terrain accessibility for machinery and environmental conditions (e.g., slope, soil moisture, stumps, etc.).
- Percentage cover of the site (i.e., the relative density of target deciduous or coniferous vegetation).
- Beneficial vegetation that should be preserved.
- Current damage to TL and related infrastructure.

8.6.9 Signage

The IPMR requires that notification signs be posted on land being treated with herbicides. Signs must be clearly visible and legible from each approach to the treatment area used by the public, including access from the forest service roads. The signs must include information on the trade name or active ingredient of the herbicide used, date and time of application, precautions to be taken to prevent harm to people entering the treatment area, the pest management plan confirmation number, and contact information.

The signs will specify re-entry date and time as well as the re-entry Personal Protection Equipment requirements.

Signage will remain in place for a minimum of 14 days after the herbicides have been applied. Records will be kept regarding how public notification was given and where signs were posted.

8.6.10 Equipment Maintenance & Calibration

58 (3) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following operational information:

(b) a description of the environmental protection strategies and procedures that will be followed under the plan, including a description of the following strategies and procedures:

(v) procedures for maintaining and calibrating pesticide application equipment;

Equipment Maintenance

The IPMR requires applicators to ensure that all equipment is in good working order and, if required, is calibrated to conform to the application rates on the herbicide label. BW Gold also requires that the Applicator's equipment:

- Meets all regulatory requirements;
- Is safe, clean, in good repair, and compatible and appropriate for the herbicide being used; and
- Nozzles are working properly or be replaced, and hose connections are not leaking.

Equipment Calibration

Application equipment must be properly calibrated by the Contractor to conform with application rates on the herbicide label. As a minimum, all sprayers should be calibrated once per year prior to use, and at regular intervals throughout the season when changing pesticide products and when nozzle output begins to vary. In general, equipment should be calibrated:

- For each individual applicator using hand-held or backpack equipment;
- Any time equipment is altered, such as a change in size or type of nozzle;
- At the beginning of each season; or
- More frequently with abrasive formulations (such as wettable powders).

As per the IPMR requirements, the Contractor must keep a record for each piece of application equipment that requires calibration, when the equipment was calibrated, and the data upon which the calibration was based.

8.6.11 Herbicides Used and Application Methods

58 (3) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following operational information:

(c) identification of each pesticide that will be used under the plan, the manner of its application and the type of equipment required for each manner of application.

The following herbicides may be used in conjunction with the application method presented in Table 8.6-4:

- aminocyclopyrachlor
- aminopyralid
- clopyralid
- dicamba
- diflufenzopyr
- fluroxypyr
- glyphosate
- imazapyr
- metsulfuron-methyl
- picloram
- triclopyr
- 2,4-D

Table 8.6-4: Typical Herbicide Application Methods[4]

Application Type	Herbicide	Essential Equipment
Hack and squirt	• Glyphosate	• Spray bottle • Backpack sprayer • Squirt bottle
Cut Stump	• Glyphosate • Picloram • Triclopyr • 2,4-D	• Spray bottle • Modified brush saw • Backpack sprayer • Squirt bottle
Injection	• Glyphosate • Imazapyr • Triclopyr	• Syringe • Injection lance
Foliar/bareground application	• Aminopyralid • 2,4-D • Aminocyclopyrachlor • Dicamba • Clopyralid • Fluroxypyr • Metsulfuron-methyl • Glyphosate • Imazapyr • Picloram • Triclopyr • Diflufenzopyr	• Wick • Boom sprayer • Backpack sprayer • Power hose
Basal Bark	• Triclopyr • Glyphosate	• Spray Bottle • Backpack sprayer

In addition to the Safety Data Sheet the following information will be required for the purpose of the treatment application plan: Registration number, Registrant Name, Product Name, Registration Status, Expiry date, Count of active ingredients, use site category, and (if unavailable) options for equivalent products (including Product name and Registration number). Some herbicide products may have the identical active ingredient(s) (both identical concentration and active constituents) but a different trade

[4] Table adapted from BC Hydro 2022

name and a different pesticide control product number issued by the federal Pest Management Regulatory Agency. These herbicides are considered equivalent and may be considered under this IVMP.

A treatment application plan will be developed by the Responsible Person prior to treatment and will be informed by consultation with Indigenous nations and CCCIPC as well as site conditions, target species and treatment objectives. The treatment application plan will indicate the herbicide and application method selected based on the target species and the risks and potential impacts to human health and indigenous plants and wildlife. The treatment application plan will include at minimum: if more than one herbicide is required, if concurrent or sequential treatment is required and/or rational for minimum acceptable wait times between treatments of the same or different products. If thickeners are required, the treatment plan will detail the thickener to be used (permitted use in a target location, product registration etc.) in addition to the risks and potential impacts to human health and indigenous plants and wildlife associated with the use of the thickeners.

8.6.12 Weather

> *58 (3) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following operational information:*
>
> *(b) a description of the environmental protection strategies and procedures that will be followed under the plan, including a description of the following strategies and procedures:*
>
> *(vi) procedures for monitoring weather conditions and strategies for modifying pesticide application methods for different weather conditions;*

Personnel will monitor weather and weather forecasts at the beginning and on a daily basis wherever herbicides are applied. Information is collected from Environment Canada and other official sources. Herbicides must be applied during daylight hours only.

The prevailing meteorological conditions including temperature, precipitation, and velocity and direction of wind, are recorded for each treatment location and each day.

Stop Work Conditions

Herbicide applications must be stopped when any of the following conditions exist in the treatment area. When herbicide label restrictions are more limiting, they will take precedence over the conditions below:

- Temperatures are outside label requirements;
- It’s raining steadily (water running consistently down the lateral stems);
- Ground wind speed exceeds 8 km an hour (for foliar applications), i.e., gentle breeze, leaves and twigs in constant motion; and
- Foliage is covered by ice or frost.

Drift Monitoring

Three factors contribute to drift: application techniques, weather conditions, and applicator error. The possibility of drift is reduced through appropriate training and certification of employees, and by not conducting foliar applications during winds over 8km/h. Also, thickeners can be added to the herbicide to increase droplet size. Spray drift is monitored during foliar applications of herbicide to establish an accurate buffer zone and the integrity of the PFZs. The drift monitoring will be detailed in the treatment plan.

8.6.13 Effectiveness Evaluation

> *58 (2) A pest management plan prepared for the purpose of section 7 (1) (a) of the Act must include the following integrated pest management elements:*
>
> *(f) a description of the monitoring program that will be employed for evaluating the effectiveness of the pesticide use on pest populations and the environment, including effects on organisms other than targeted pests, by comparison with the information collected under the program described in paragraph (c), which program must include a description of:*
>
> *(i) the monitoring methods,*
>
> *(ii) the frequency of monitoring, and*
>
> *(iii) the data that will be collected.*

Post-treatment evaluations may be carried out to ensure effectiveness of herbicide application in accordance with Section 35(2) of the IPMR, which requires that records of the date of assessment, treatment date, treatment results, effectiveness, and impacts be kept. Evaluation results are used to revise site prescriptions and to provide the basis for improvements and changes to the vegetation management process.

Evaluations of herbicide applications are visual in nature and are typically conducted on the ground. The exact timing and procedure will depend on the treatment methods used, the geographic area, the type and condition of the site, the vegetation being controlled, and the season. Reasonable efforts will be made to ensure that treatment sites are evaluated within one year of the treatment.

Evaluation results are used to revise site prescriptions and to provide the basis for improvements and changes to the program. The following will be considered in evaluation of any herbicide applications:

- Effectiveness of the herbicide treatment in controlling the target vegetation;
- Need for follow-up treatments;
- Amount of herbicide used;
- Need to adjust application rate;
- Any impact of the herbicide application on non-target species;
- Whether the technique was the most appropriate one for the job; and
- Incidental impacts to non-target species, if any.

8.7 Manual and Mechanical Controls

8.7.1 Manual and Mechanical Methods

There are a number of physical or mechanical methods that may be used depending on method criteria.

Hand-pulling

Hand-pulling is a treatment option for areas with small infestations of invasive plants in areas and typically used in riparian areas. This technique is not used when to close to the TL or the infestation is large. Hand-pulling may not remove all of the roots hence not used with species that regrow from just root fragments.

Girdling

Girdling is a technique that entail cutting the bark around a tree trunk using a saw or chain. The bark and tissue down to the sapwood is removed. This technique is commonly used in riparian and other sensitive environments but cannot be effective over large areas or in dense brush.

Brushing

Brushing is a method that removes individual woody stems through the use of hand tools. These stems pose a risk to equipment in the area. This method is used for species that are more likely to die when cut and is able to immediately remove the risk. However, this method is labour intensive and can be dangerous on steep terrain.

Hedge Trimming

Hedge trimming is a method that uses shears to maintain the form of vegetation. This technique is commonly used in public areas to create a pleasing aesthetic. This method is a relatively inexpensive option but requires qualified people to perform the work on an annual basis.

Mowing

Mowing is a method that cuts target vegetation using a cutting machine that is moved over the site. This method can be used for high density vegetation with small diameter stems. The vegetation is mulched and biodegrades which helps to reduce fire risk and reduces fuel loading. However, this method may cause vegetation to regrow thicker and cannot be used in riparian areas.

Weed Trimming

Weed trimming is a method that uses power tools to remove the heads of weeds. The species are cut when present in small densities and removes the seed head. This method is not successful when species can propagate from the stem.

Pruning

Pruning is a technique that involves removing limbs or branches from trees that may grow toward power lines. This technique does not have as significant public opposition compared to tree removal. Considering the repeating pruning, this technique is costly.

8.7.2 Pre-treatment Inspection Procedures

Pre-treatment inspection procedures completed for herbicide control will be applied to determine environmentally sensitive features that require specific protection within the manual and mechanical treatment area. In addition, BW Gold will undertake focused engagement with Indigenous groups and stakeholders that may be impacted by the use of the selected treatment controls on the RoW including Crown land managers and adjacent private landowners.

Prior to initiating the works, any specific environmental concerns are discussed with the contractor and the boundary is flagged. Before applications begin the following topics will be reviewed with each individual who will be using manual and mechanical methods:

- Boundaries of the treatment area;
- Requirements for personal protection equipment;
- Mechanical equipment procedures;
- Target species to be controlled, the desirable species to be protected during treatments, and how to identify these plants/trees; and
- Detailed map showing the proposed treatment areas and areas to be protected from manual and mechanical controls in the treatment area.

8.7.3 Monitoring Procedures

Pre-treatment evaluation will utilize ground and/or aerial inspection of the RoW for areas requiring vegetation management. The RoW will be monitored on a cycle, determined by the final species composition, projected growth rates, and clearance requirements. It is anticipated the RoW will be inspected every 3 to 5 years.

The following information may be collected during this evaluation and will be used to define the treatment plan:

- Access road conditions that may affect the types of equipment that can be brought on site.
- Presence of sensitive ecosystems that may contain rare and endangered species and/or riparian ecosystems.
- Any imminent threats to infrastructure or safety.
- Tree heights and proximity to approach limits.
- Species and functional group (deciduous, conifer, root-suckering, resprouting, low-growing, etc.).
- Species distribution (e.g., clumped, scattered).
- Tree diameter
- Occurrence or proximity of low-growing native forage or ground cover species (i.e., species that will survive the treatment and naturally spread to revegetate the intended area).
- Occurrence and intensity of re-sprouting or suckering.
- Terrain accessibility for machinery and environmental conditions (e.g., slope, soil moisture, stumps, etc.).
- Percentage cover of the site (i.e., the relative density of target deciduous or coniferous vegetation).
- Beneficial vegetation that should be preserved.
- Current damage to TL and related infrastructure.

8.7.4 Spill Response Plan

The TL FMSCP will be applicable for manual and mechanical controls. BW Gold will procure an experienced, licensed, and insured RoW management contractor(s) to manage vegetation on the RoW during operations. Licensed operators are subject to training and testing which includes spill response requirements. In addition to licence obligations, BW Gold's contract terms with the RoW management contractor will include the specification that any spill and remedial actions will conform to provincial regulatory requirements.

8.7.5 Weather

The Responsible Person conducting vegetation control will monitor the weather forecast daily, and current weather conditions if applicable, to anticipate the need for scaling back planned activities or adverse weather shutdown (i.e., extreme high or low temperatures, strong winds, high rainfall or snowfall, lightning) depending on activities. Treatment must be applied during daylight hours only.

8.7.6 Equipment Maintenance and Calibration

All equipment (e.g., tractor, bulldozer, chainsaw, etc.) will be maintained as follows:

- Meet all regulatory requirements;
- Is safe, clean, in good repair, and compatible and appropriate for the control method used; and
- Nozzles are working properly or be replaced, and hose connections are not leaking.

8.7.7 Effectiveness Evaluation

Post-treatment evaluations may be carried out to ensure effectiveness of manual and mechanical control that includes a record of the date of assessment, treatment date, treatment results, effectiveness, and impacts. Evaluation results are used to revise site prescriptions and to provide the basis for improvements and changes to the vegetation management process.

Evaluations are visual in nature and are typically conducted on the ground. The exact timing and procedure will depend on the treatment methods used, the geographic area, the type and condition of the site, the vegetation being controlled, and the season. Reasonable efforts will be made to ensure that treatment sites are evaluated within one year of the treatment.

Evaluation results are used to revise site prescriptions and to provide the basis for improvements and changes to the program. The following will be considered in evaluation of any cultural/natural control applications:

- Effectiveness of the treatment in controlling the target vegetation;
- Need for follow-up treatments;
- Any impact of the application on non-target species;
- Whether the technique was the most appropriate one for the job; and
- Incidental impacts to non-target species, if any.

8.8 Cultural/Natural Control

8.8.1 Cultural/Natural Control Methods

The cultural/natural control method is vegetation management that occurs prior to the growth of the target species through managed landscapes like crops, parks, and pastures. Physical barriers like rocks, asphalt, and geotextiles can be used as barriers to weed growth. Additional technique is to seed low maintenance grasses to ensure a robust vegetation community that makes it less likely for weeds to colonize. This technique can create environments that are compatible with the intended use of the area but is a higher cost technique and not well suited to the general TL environment.

8.8.2 Pre-treatment and Inspection Procedures

Pre-treatment inspection procedures for herbicide control apply to determine environmentally sensitive features that require specific protection within the cultural/natural control treatment area. In addition, BW Gold will undertake focused engagement with Indigenous groups and stakeholders that may be impacted by the use of cultural/natural control on the RoW including Crown land managers and adjacent private landowners.

Prior to initiating the works, any specific environmental concerns are discussed with the contractor and the boundary is flagged. Before applications begin the following topics will be reviewed with each individual who will be using cultural/natural control:

- Boundaries of the treatment area;
- Requirements for personal protection equipment;
- Target species to be controlled, the desirable species to be protected during treatments, and how to identify these plants/trees; and
- Detailed map showing the proposed treatment areas and areas to be protected from manual and mechanical controls in the treatment area.

8.8.3 Monitoring Procedures

Pre-treatment evaluation will utilize ground and/or aerial inspection of the RoW for areas requiring vegetation management. The RoW will be monitored on a cycle, determined by the final species composition, projected growth rates, and clearance requirements. It is anticipated the RoW will be inspected every 3 to 5 years.

The following information may be collected during this evaluation and will be used to define the treatment plan:

- Access road conditions that may affect the types of equipment that can be brought on site;
- Presence of sensitive ecosystems that may contain rare and endangered species and/or riparian ecosystems;
- Any imminent threats to infrastructure or safety;
- Tree heights and proximity to approach limits;
- Species and functional group (deciduous, conifer, root-suckering, resprouting, low-growing, etc.);
- Species distribution (e.g., clumped, scattered);
- Tree diameter;
- Occurrence or proximity of low-growing native forage or ground cover species (i.e., species that will survive the treatment and naturally spread to revegetate the intended area);
- Occurrence and intensity of re-sprouting or suckering;
- Terrain accessibility for machinery and environmental conditions (e.g., slope, soil moisture, stumps, etc.);
- Percentage cover of the site (i.e., the relative density of target deciduous or coniferous vegetation);
- Beneficial vegetation that should be preserved; or
- Current damage to TLs and related infrastructure.

8.8.4 Spill Response

The TL FMSCP will be applicable. BW Gold will procure an experienced, licensed, and insured RoW management contractor(s) to manage vegetation on the RoW during operations. Licensed operators are subject to training and testing which includes spill response requirements. In addition to licence obligations, BW Gold's contract terms with the RoW management contractor will include the specification that any spill and remedial actions will conform to provincial regulatory requirements.

8.8.5 Weather

The Responsible Person conducting vegetation control will monitor the weather forecast daily, and current weather conditions if applicable, to anticipate the need for scaling back planned activities or adverse weather shutdown (i.e., extreme high or low temperatures, strong winds, high rainfall or snowfall, lightning) depending on activities. Treatment must be applied during daylight hours only.

8.8.6 Equipment Maintenance and Calibration

All equipment (e.g., tractor, bulldozer, chainsaw, etc.) used for culture/natural control will be maintained as follows:

- Meet all regulatory requirements;
- Is safe, clean, in good repair, and compatible and appropriate for the control method used; and
- Nozzles are working properly or be replaced, and hose connections are not leaking.

8.8.7 Effectiveness Evaluation

Post-treatment evaluations may be carried out to ensure effectiveness of cultural/natural control that includes a record of the date of assessment, treatment date, treatment results, effectiveness, and impacts. Evaluation results are used to revise site prescriptions and to provide the basis for improvements and changes to the vegetation management process.

Evaluations are visual in nature and are typically conducted on the ground. The exact timing and procedure will depend on the treatment methods used, the geographic area, the type and condition of the site, the vegetation being controlled, and the season. Reasonable efforts will be made to ensure that treatment sites are evaluated within one year of the treatment.

Evaluation results are used to revise site prescriptions and to provide the basis for improvements and changes to the program. The following will be considered in evaluation of any cultural/natural control applications:

- Effectiveness of the treatment in controlling the target vegetation;
- Need for follow-up treatments;
- Any impact of the application on non-target species;
- Whether the technique was the most appropriate one for the job; and
- Incidental impacts to non-target species, if any.

9.0 Monitoring

Table 9-1 presents the vegetation monitoring program that will be conducted. Monitoring will be performed by appropriately qualified Environmental Monitors, under the direction of the BW Gold EM.

Quality assurance / quality control (QA/QC) procedures will be followed during surveys and monitoring. Qualified persons will conduct the surveys and will be provided with training on appropriate monitoring techniques to standardize field methods. Field data sheets or a digital survey form will be used to standardize data collection. Observations indicated in either field data sheets or digital survey forms will be reviewed at the end of day by the surveyor. All data will be transferred to a database and will be

reviewed prior to analysis and reporting. Depending on the amount of data, a random, statistically representative sample of the data may be queried, or the entire database may be queried for QA/QC.

Table 9-1: Vegetation Monitoring Program

Monitoring Activity	Measurable Parameter (s)	Frequency	Timing
Office and field review of pre-clearing surveys and boundaries	• Pre-clearing survey is completed and sensitive features and mitigation specified • Boundaries and works zones flagged (RMAs) • Clearing is within LOO and OLTC permit boundary • Clearing work windows are identified and work is during the correct window	Variable	Prior to clearing occurring
Vegetation clearing	• Clearing dimension size in relation to planned activity • Avoidance of rare plants, ecosystems at risk, riparian areas, and wetlands through implementation of pre-clearing survey, flagging, and mitigation measures	Variable	When clearing is occurring
	Clearing work windows: • Breeding bird season (refer to the WMMP Table 3.3-1) • Sensitive wildlife species (refer to the WMMP)	Variable	When clearing is occurring
Post-clearing revegetation	• Total area disturbed (m^2) • Total area (m^2) revegetated and the specific prescriptions • Revegetation plots including vegetation species cover, composition, diversity and, invasive plant species • Documentation of evidence of erosion including sheet erosion, rills, gullies • Documentation of evidence of sedimentation in receiving environment • Periodic inspections of the re-vegetated areas to assess performance objectives (including photos) compared to prescription targets • Evaluation of the success of the revegetation prescriptions in meeting site objectives and, if required, identification of additional mitigation activities	Annual	May to October

Monitoring Activity	Measurable Parameter (s)	Frequency	Timing
Post-clearing windthrow and hazard tree monitoring	• The effectiveness of windthrow reduction measures used • The number and species of wind-thrown and hazard trees • The approximate area affected • Bark beetle presence (e.g., Douglas-fir or spruce bark beetle)	Starting the year after clearing and every 3 to 5 years during TL operation	March to September
Vegetation maintenance	• Vegetation management on transmission line RoW (see Sections 8.6.7, 8.6.8, and 8.6.13 for further details) • Location(s) of invasive plant species • Location(s) where invasive plant treatment or controls have been applied	Starting the year after clearing and every 3 to 5 years during TL operation	Variable
	• Document management actions in RMAs to confirm consistent with RMA mitigation measures	Variable	When activity in RMA occurs
Woody debris management	• Volume of wood cut (identified in License to Cut) • Volume of wood stockpiled or used for progressive reclamation • Volume of wood disposed of or sold • Assess fire hazard of stored woody debris • Bark beetles present that may cause forest health issues (e.g., Douglas-fir or spruce bark beetle)	Annual	April to October (fire hazard assessments); May to August (beetle assessments)

10.0 Reporting and Record Keeping

10.1 Reporting

10.1.1 Incidental Observations

Incidental observations of invasive plant species in the field will be flagged, photographed, and recorded as follows:

- Type of observation (e.g., if suspected invasive species);
- Project area (UTM coordinates if possible);
- Date of observation; and
- Name of observer.

Incidental observations will be recorded using a standard field data sheet and submitted to the EM daily. The EM will follow up on incidental observation reports within one week. If there is a new invasive plant observation, the EM will complete an IAPP report (Appendix C).

10.1.2 Annual Notice of Intent to Treat

As per Section 42 of the IPMR, BW Gold will forward an Annual Notice of Intent to Treat (NIT), in writing to ENV, at least 21 days prior to treatment in each year during which the pest management plan is in effect. The NIT will identify:

- The proposed treatment areas;
- The geographic features that require a pesticide-free zone or a no-treatment zone.
- Name and business location of confirmation holder;
- Proposed treatments;
- Pesticides proposed for use and their method of application; and
- The total area proposed for treatment.

10.1.3 Annual Report for Confirmation Holders

In accordance with Section 39 of the IPMR, BW Gold will provide to the Regional Administrator the following information for a calendar year by January 31 in the next calendar year for operations conducted under this pest management plan during the calendar year:

- The name and address of the confirmation holder, and their confirmation number;
- Trade name and active ingredient of the pesticide(s) applied, including their PCP numbers;
- Total area treated; and
- Quantity of each active ingredient applied.

10.2 Record Keeping

The EM is responsible for data management, reporting and records related to vegetation management. Monitoring data will be entered into an electronic database and have quality control checks completed upon receipt of results. Data will be entered into a standard format that allows for data reporting and analyses. Data and data comparisons will be stored in a single file format for each type of survey or monitoring activity. Monitoring data will be stored for the life of the Project and will be made available for review upon request.

11.0 Evaluation and Adaptive Management

The trigger action response plan for vegetation is provided in Table 11-1.

In terms of invasive plants, the objective is to promptly detect, inventory, eradicate and monitor. In the event, a new invasive species is discovered within the TL RoW, adaptive management will be implemented and would include:

- Confirm species taxonomy by engaging a QP;
- Source management monitoring, determine the extent of the plant distribution;
- Determine the treatment plan in consultation with Aboriginal Groups, CCCIPC and ENV;
- Implement the plan; and
- Monitor treatment effectiveness.

Considerations to include when revegetating an area to control invasive species include: seed or plant availability of species appropriate to and locally-adapted to the site, timing of seeding/planting, soil conditions, precipitation for establishment, and if site preparation is required.

Table 11-1: Trigger Action Response Plan

Metric	Level 0 Alert		Level 1 Alert		Level 2 Alert	
	Trigger	**Action/Response**	**Trigger**	**Action/Response**	**Trigger**	**Action/Response**
Total cleared area (ha)	• Clearing matches the areas predicted in the EA (<5% increase over predicted areas)	• Conduct ongoing monitoring for compliance with the IVMP	• Total area clearing exceeds areas predicted in the EA (>5% and less than 15% increase over predicted areas)	• EM to review clearing plans identify causes for increases over EA predictions (e.g., new permits for approved disturbance where required) and identify solutions • Evaluate if changes are required to onsite approval processes, methods, or monitoring program requirements • Review and update the IVMP • If required review the predicted effects in the EA and revise as required	• Total area clearing exceeds areas predicted in the EA (>15% increase over predicted areas)	• Notify Indigenous nations and regulators • EM to review clearing plans identify causes for increases over EA predictions (e.g., new permits for approved disturbance where required) and identify solutions • Evaluate if changes are required to onsite approval processes, methods, or monitoring program requirements • Review and update the IVMP • If required review the predicted effects in the EA and revise as required • Implement changes based on the evaluation as required • Implement progressive reclamation and/or offsetting as required
Pre-clearing survey and flagged clearing boundaries	• Clearing matches approved and flagged clearing boundary	• Conduct ongoing monitoring for compliance with the IVMP	• Area clearing exceeds approved cleared area or flagged clearing boundary is incorrect	• EC to review clearing plans and boundary marking with site personnel and identify causes and solutions • Evaluate if changes are required to onsite approval processes, pre-clearing methods, methods, or monitoring program requirements • Review and update the IVMP	• Area Clearing exceeds approved cleared area or flagged clearing boundary is incorrect and clearing extends beyond *Mines Act* permit boundaries	• Notify Indigenous nations and regulators • EM to review clearing plans and boundary marking with site personnel and identify causes • Evaluate what changes are required to onsite approval processes, pre-clearing methods, or monitoring program requirements • Implement changes based on the evaluation as required • Implement progressive reclamation and/or offsetting as required • Review and update the IVMP
Management Area zones and mitigation followed	• Appropriate zones (e.g., RRZ and RMZ) flagged • Clearing and work activities meet approved riparian work practices • Clearing occurs within the approved work windows	• Conduct ongoing monitoring for compliance with the VMP	• Management zones incorrectly flagged • Clearing and work activities do not meet approved work practices for each management zone • Clearing occurs within the approved work windows	• EM to review clearing plans and boundary marking with site personnel and identify causes and solutions • Evaluate if changes are required to onsite approval processes, pre-clearing methods, methods, or monitoring program requirements	• Management zones incorrectly flagged • Clearing and work activities do not meet approved work practices for each management zone • Clearing occurs outside the approved work windows	

Metric	Level 0 Alert		Level 1 Alert		Level 2 Alert	
	Trigger	**Action/Response**	**Trigger**	**Action/Response**	**Trigger**	**Action/Response**
Revegetation	• Monitoring indicates revegetation meets prescription goals and targets	• Conduct ongoing monitoring for compliance with the IVMP	• Monitoring indicates revegetation prescription goals and targets have not been consistently met but no significant environmental issues are occurring (e.g., erosion issues, establishment of invasive plants)	• EM to review prescriptions to determine appropriate adaptive measures • Continue site monitoring to track vegetation trajectory (e.g., improving / declining) • Identify and implement seeding / planting / erosion controls to meet prescription goals and targets as required • Review and update the IVMP	• Monitoring indicates revegetation prescription goals and targets have not been met and significant environmental issues are occurring (e.g., erosion issues, establishment of invasive plants)	• Notify Indigenous nations and regulators • EM to review prescriptions to determine appropriate adaptive measures • Identify and implement immediate seeding / planting / erosion control to meet prescription goals and targets • Continue site monitoring to track vegetation trajectory (e.g., improving / declining) • Review and update the IVMP
Windthrow	• Windthrow amounts are not greater than 20% of predicted volumes / amounts	• Conduct ongoing monitoring for compliance with the IVMP	• Windthrow amounts exceed 20% but are less than 50% of predicted volumes / amounts by	• Review windthrow assessment procedures • Assess windthrow to determine if bark beetles or fire risk require salvage of downed trees • Review and update the IVMP	• Windthrow amounts exceed 50% predicted volumes / amounts	• Notify Indigenous nations and regulators • Review windthrow assessment procedures • Assess windthrow to determine if bark beetles or fire risk require salvage of downed trees • Implement changes to windthrow mitigation measures to reduce future windthrow damage as required • Review and update the IVMP
Woody debris: volume, bark beetle, and fire hazard assessments	• Woody debris is stored for use during reclamation or used for progressive reclamation • Bark beetles are not observed in stored woody debris • Stored material does not present a fire hazard	• Conduct ongoing monitoring for compliance with the VMP	• Woody debris is sold or disposed of • Bark beetles are noted in stored woody debris • Stored material is assessed as a fire hazard	• EM to review woody debris amounts required during closure and current stored woody debris to identify volume requirements • Evaluate if changes are required to woody debris management procedures if wood debris has been disposed of and stockpile volumes are insufficient for reclamation purposes • Adopt measures to control bark beetle infestation and spread • Adopt measures to reduce fire hazard • Review and update the IVMP	• N/A	• N/A
Vegetation maintenance	• Vegetation in maintained areas meets mitigation requirements	• No response	• Vegetation in maintained areas does not meets mitigation requirements (e.g., vegetation height along roads edges)	• EM to review vegetation maintenance plans and with site personnel and identify causes and solutions • Review and update the IVMP	• Near misses or accidents occur related to vegetation that has not been maintained (e.g., conflicts with wildlife along roads due to poor visibility)	• Notify Indigenous nations and regulators • EM and Safety Committee to review vegetation maintenance requirements and procedures with site personnel and identify causes • Evaluate what changes are required to vegetation maintenance methods or monitoring program requirements • Implement changes based on the evaluation as required • Review and update the IVMP

12.0 Plan Revision

The TL IVMP is a living document and any plan revisions will be made in accordance with the plan this is appended to (Condition 13 – Construction Environmental Management Plan).

13.0 Qualified Professionals

This TL IVMP has been developed under the direct supervisions of, or reviewed by, the following QP:

ORIGINAL SIGNED

Wade Brunham, R.P.Bio.
Partner, ERM

Approval Signature Record

Reviewer Role	Name	Signature	Date

References

Primary Sources

1985. *Seeds Act*, RSC. c. S-8.

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Appendix A: Standard Operating Procedures

Appendix A1	Old Growth Forest Standard Operating Procedure
Appendix A2	Rare and At-Risk Plant Species Management Standard Operating Procedure
Appendix A3	Riparian Area Management Standard Operating Procedure
Appendix A4	Wetlands Management Standard Operating Procedure
Appendix A5	Coarse Woody Debris Management
Appendix A6	Invasive Plant Management Standard Operating Procedure
Appendix A7	Invasive Plant Species Monitoring

Blackwater Gold Mine

Old Growth Forest Management

STANDARD OPERATING PROCEDURE

April 2023 Version 2.0

Scope:	To define a standard operating procedure (SOP) for safe and efficient work practices to manage old growth forest.	
Contacts:	Jack Love/Sarah Harrison Environmental Manager	jlove@artemisgoldinc.com/ sharrison@artemisgoldinc.com
Document Ownership:	Mine Manager	

1. SCOPE

This standard operating procedure (SOP) for old growth forest management applies to all employees, contractors, and subcontractors/vendors at the Blackwater Gold Mine (Blackwater) during construction, operation, and closure. Procedures focus on minimizing disturbance and preservation of old growth forest stands outside the Project footprint.

2. RESPONSIBILITIES

Individuals with key roles and responsibilities with respect to riparian area management are presented in Table 2-1.

Table 2-1: Blackwater Roles and Responsibilities

Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, Environmental Management System (EMS) implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the General Manager.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. Reports to the Mine Manager.
Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement, and Construction Management contractor, other contractors, the Company, and regulatory agencies, where required. The Environmental Manager informs the Environmental Monitors of current site conditions that may influence monitoring programs. Supports the CM and reports to the Mine Manager.
Departmental Managers	Departmental Managers are responsible for the implementation of this SOP relevant to their areas. Report to the Mine Manager.
Employees and Contractors	Employees and contractors are responsible for implementing the SOP as they pertain to their job responsibilities and requirements.

3. STANDARD OPERATING PROCEDURES

3.1 Pre-construction

During pre-construction planning (prior to clearing) the EM and CM will review baseline old growth forest mapping relative to the proposed clearing footprint (Figure 1 and Figure 2). The age of old growth forests varies from one Biogeoclimatic (BGC) unit to another. Forests that occur in areas where stand-initiating events are frequent have shorter intervals since their last disturbance, and old growth forests in these areas are generally older than 140 years (i.e., BGC unit SBSdk, SBSdw3, SBSmc2, and SBSmc3). The time since the last disturbance in stands with infrequent stand-initiating events is greater, and old growth forests in these areas are generally older than 250 years old (BGC unit ESSFmv1, and ESSFmv1p). The mine site, mine site access road, freshwater supply system, and airstrip were mapped using a standard Terrestrial Ecosystem Mapping (TEM)[1] approach based on bioterrain and three-dimensional (3D) aerial photograph interpretation employing 2011 aerial photography and LiDAR (Light Detection and Ranging). Field-based ecosystem mapping was based on the Standards for Terrestrial Ecosystem Mapping in British Columbia[1], data collection was based on the principles and methods outlined by the Field Manual for Describing Terrestrial Ecosystems[2], and Ecosystem classification was based on the Land Management Handbook 24[3]. The mine site, due to a higher degree of anticipated disturbance, required a survey intensity level of 3 (25% to 50% polygon inspections). Survey plots completed in 2011 focused on data from the mine site. The subsequent field survey in 2012 focused on data from the proposed freshwater supply system and transmission line. The final field survey in 2013 focused on data from the mine site, proposed mine access road, airstrip, and transmission line. The amount of old growth forest in each of the Project components was calculated based on the ecosystem map. In TEM, structural Stage 7 represents old forest; therefore, ecosystem units mapped as structural Stage 7 were selected to represent old growth forest. Structural stage was cross-referenced with Vegetation Resource Inventory to validate the structural stage attribute.

The CM will identify potential opportunities to limit the cleared footprint within the old growth forest, pending operational requirements, and adjust the clearing plan accordingly. Site drainage will also be evaluated during this review to mitigate any potential changes to hydrology within old growth areas including erosion and sedimentation control.

Once the disturbance boundary is established, survey will clearly stake and flag the edge of the disturbance boundary such that it is clearly visible to loggers and equipment operators.

[1] Resource Inventory Committee (RIC). 1998. Standard for Upland Ecosystem Mapping in British Columbia. Province of BC. Victoria

[2] British Columbia Ministry of Forests and Range and British Columbia Ministry of Environment (MOFR & MOE). 2010. Field Manual for Describing Ecosystem Upland Ecosystems 2nd Edition.

[3] DeLong, C., Tanner, D., and Jull, M.J. 1993. A Field Guide for Site Identification and Interpretation for the Southwest Portion of the Prince George Forest Region. British Columbia Ministry of Forests. Land Management Handbook Number 24.

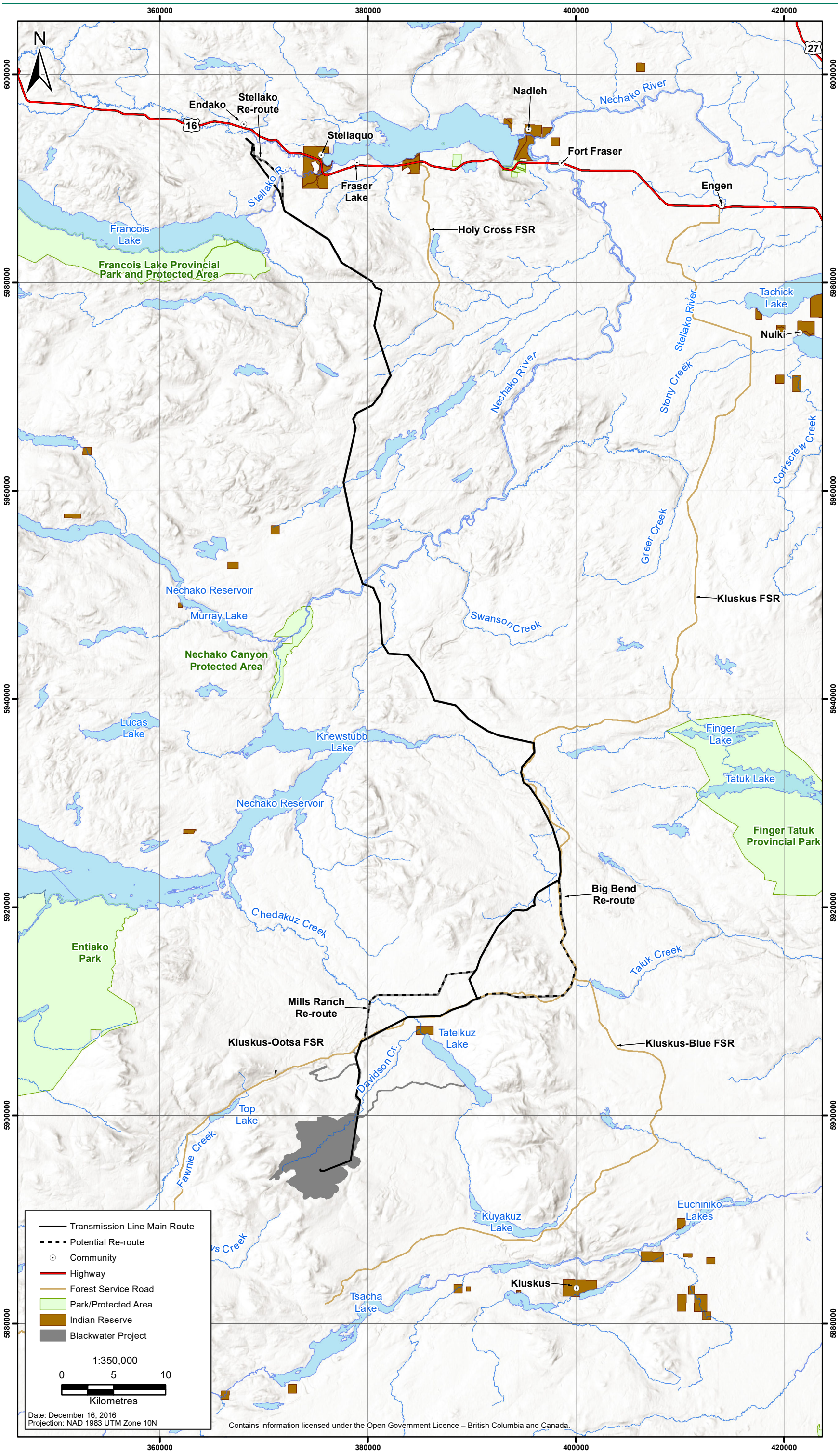

Figure 3.1-5: Transmission Line Route

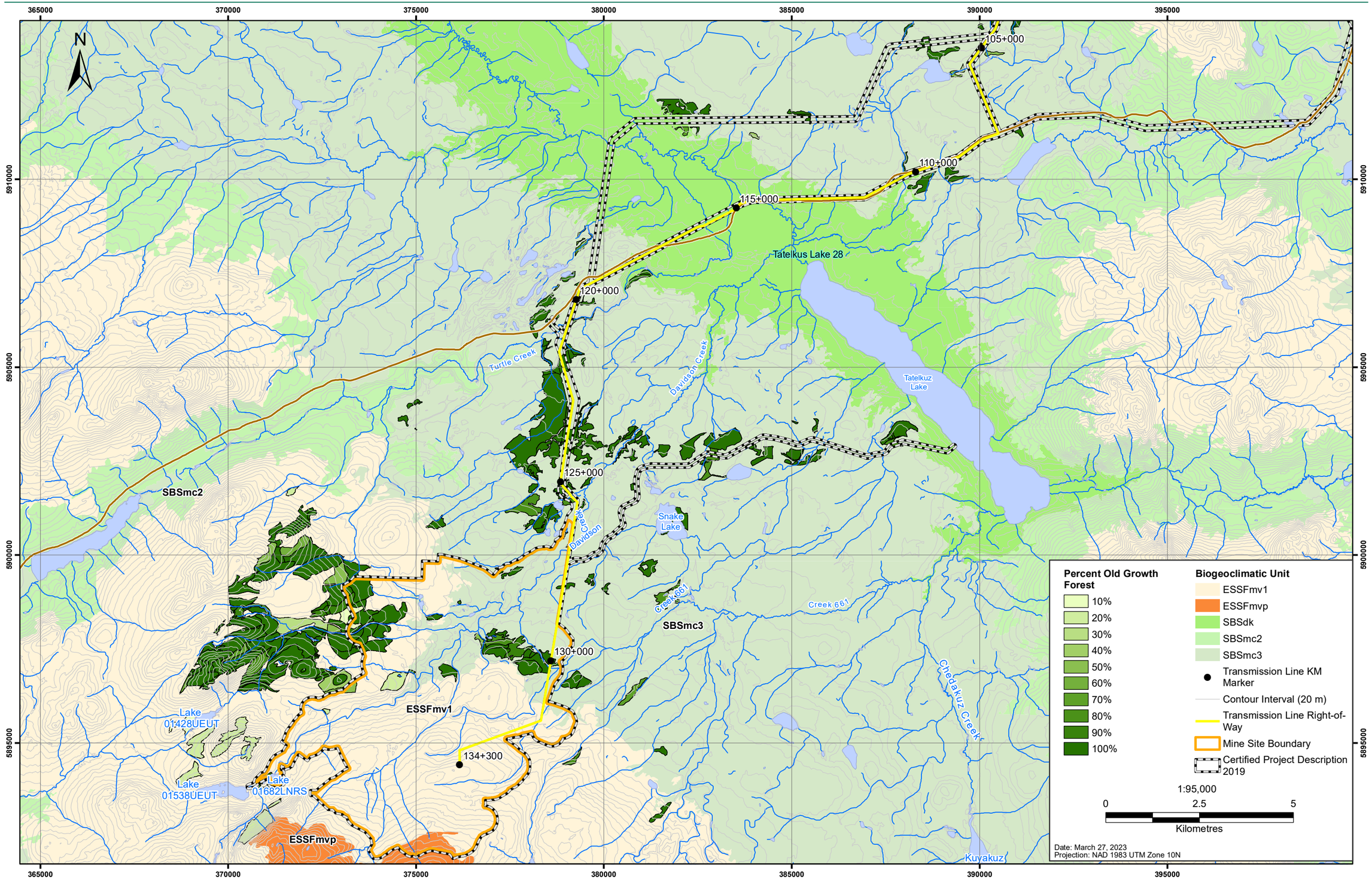

Figure 2: Old Growth Forest Areas and Biogeoclimatic Units within the Transmission Line Right-of-Way

3.2 Construction

The spatial boundary and SOPs below will be reviewed with all logging/construction staff at morning tailgate meeting(s) when working near an old growth forest disturbance limit. SOPs for active work around the old growth forest boundary include:

- Prior to the start of logging/clearing the final clearing boundary and setback buffers determined during pre-construction planning will be flagged and loaded into GPS systems held by all logging/clearing crews, if applicable. All clearing boundaries and setback buffers will be walked and reviewed with clearing crews prior to clearing.
- Management actions (with restrictions, e.g., no heavy machinery, no refueling, etc.) around the setback buffers will be identified.
- Activity within the setback buffers will be limited to foot traffic and felling of trees that pose a windthrow risk and subsequently a health and safety risk. Approval by the EM is required and will be on a case-by-case basis. Felled trees in the setback buffer are to be left in place.
- Activity within the setback buffer may be permitted if staff find that the ground conditions are not as mapped during the pre-construction planning and may pose a health and safety threat. Approval by the EM is required and will be on a case-by-case basis.
- Fell trees into the disturbance boundary (i.e., not into the setback buffer) whenever possible.
- Maintain ‘century trees’ that lie on or near the disturbance boundary, whenever possible.

3.3 Operation and Closure

The setback buffer and associated disturbance limit will be maintained throughout the Operation and Closure phases. This will be achieved with signage to notify employees of old growth forest and the associated management actions. Signs will be erected in Year +1, spaced a maximum of every 200 m along appropriate boundaries.

4. REVISION, REVIEW, AND APPROVAL

Version	Date	Nature of Change	Page Inserted, Replaced, Revised, or Cancelled	Prepared By (Qualified Registered Professional)
1.0	TBD	First version of the SOP after draft was finalized	Not applicable	
2.0	April 2023	Incorporate formal review comments	All	

Reviewed by:

Environmental Manager

_____	_____	_____
Print	Signature	Date

Approved by:

Mine Manager

_____	_____	_____
Print	Signature	Date

Blackwater Gold Mine

Rare and At-Risk Plant Species Management

STANDARD OPERATING PROCEDURE

April 2023 Version 2.0

Scope:	To define a standard operating procedure (SOP) for safe and efficient work practices to minimize impacts to native vegetation, sensitive ecosystems, listed plant species and ecosystems.	
Contacts:	Jack Love/Sarah Harrison Environmental Manager	jlove@artemisgoldinc.com/ sharrison@artemisgoldinc.com
Document Ownership:	Mine Manager	

1. SCOPE

This standard operating procedure (SOP) for rare and at-risk plant species and ecosystem management applies to all employees, contractors, and subcontractors/vendors at the Blackwater Gold Mine (Blackwater) during Construction, Operation, and Closure. Procedures focus on minimizing disturbance and preservation of traditional plants, listed plant species, and plant species and ecosystems at-risk within the Project footprint.

Within the mine site, listed plant species and species-at-risk include: whitebark pine (*Pinus albicaulis; Species-at-Risk Act Schedule 1 Endangered; BC Conservation Data Centre [BC CDC] blue-listed*), sickleleaf tomentypnum moss (*Tomentypnum falcifolium; BC CDC yellow-listed*), small-flowered lousewort (*Pedicularis parviflora* spp. *Parviflora; BC CDC yellow-listed*), swollen beaked sedge (*Carex rostrata; BC CDC yellow-listed*) and meesia moss (*Meesia longiseta; BC CDC blue-listed*) (Figure 1.1-1; Appendix A).

There are no listed ecosystems at-risk.

2. RESPONSIBILITIES

Individuals with key roles and responsibilities with respect to rare and species-at-risk management are presented in Table 2-1.

Table 2-1: Blackwater Roles and Responsibilities

Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, Environmental Management System (EMS) implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the General Manager.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. Reports to the Mine Manager.

Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement, and Construction Management contractor, other contractors, the Company, and regulatory agencies, where required. The Environmental Manager informs the Environmental Monitors of current site conditions that may influence monitoring programs. Supports the CM and reports to the Mine Manager.
Departmental Managers	Departmental Managers are responsible for the implementation of this SOP relevant to their areas of responsibility. Report to the Mine Manager.
Employees and Contractors	Employees are responsible for being aware of SOP requirements specific to their roles and responsibilities. Employees and contractors can report any incidental observations of plant species at risk to the EM. Report to Departmental Managers.

3. STANDARD OPERATING PROCEDURES

3.1 Pre-construction

During pre-construction planning (prior to clearing) the EM will review baseline listed and species-at-risk mapping relative to the proposed clearing footprint (Figure 3.1-1), and if there is overlap ensure that the regulatory framework is in place for the potential disturbance. The CM will further identify potential opportunities to limit the cleared footprint within areas of listed and plant species-at-risk, pending operational requirements, and adjust the clearing plan accordingly. Anticipated site drainage will also be evaluated during this review, to mitigate any potential changes to hydrology within areas occupied by listed or at-risk plants and plant communities.

If a disturbance boundary is required based on the review of the species-at-risk mapping, delineation areas will be established through a survey will clearly stake and flag the edge of the disturbance boundary such that it is clearly visible to loggers and equipment operators. Information and/or maps showing clearing boundaries will also be shared with loggers and equipment operators involved in clearing operations.

Provide orientation to workers on whitebark pine identification to minimize the disturbance to whitebark pine. Workers that are actively working around a previously delineated area species-at-risk disturbance boundary will be provided with Appendix A to potentially identify species at risk in the area.

BW Gold will develop fire management plans, including consideration of whitebark pine on Mount Davidson in suppression planning.

3.2 Construction

The spatial boundary and SOPs below will be reviewed with all logging/construction staff at morning tailgate meeting(s) when working near listed and plant species-at-risk disturbance limit. SOPs for active work around listed and plant species-at-risk boundary include:

- Review relevant mitigation measures in the Vegetation Management Plan, Whitebark Pine Management Plan, and Wetland Management and Offsetting Plan;

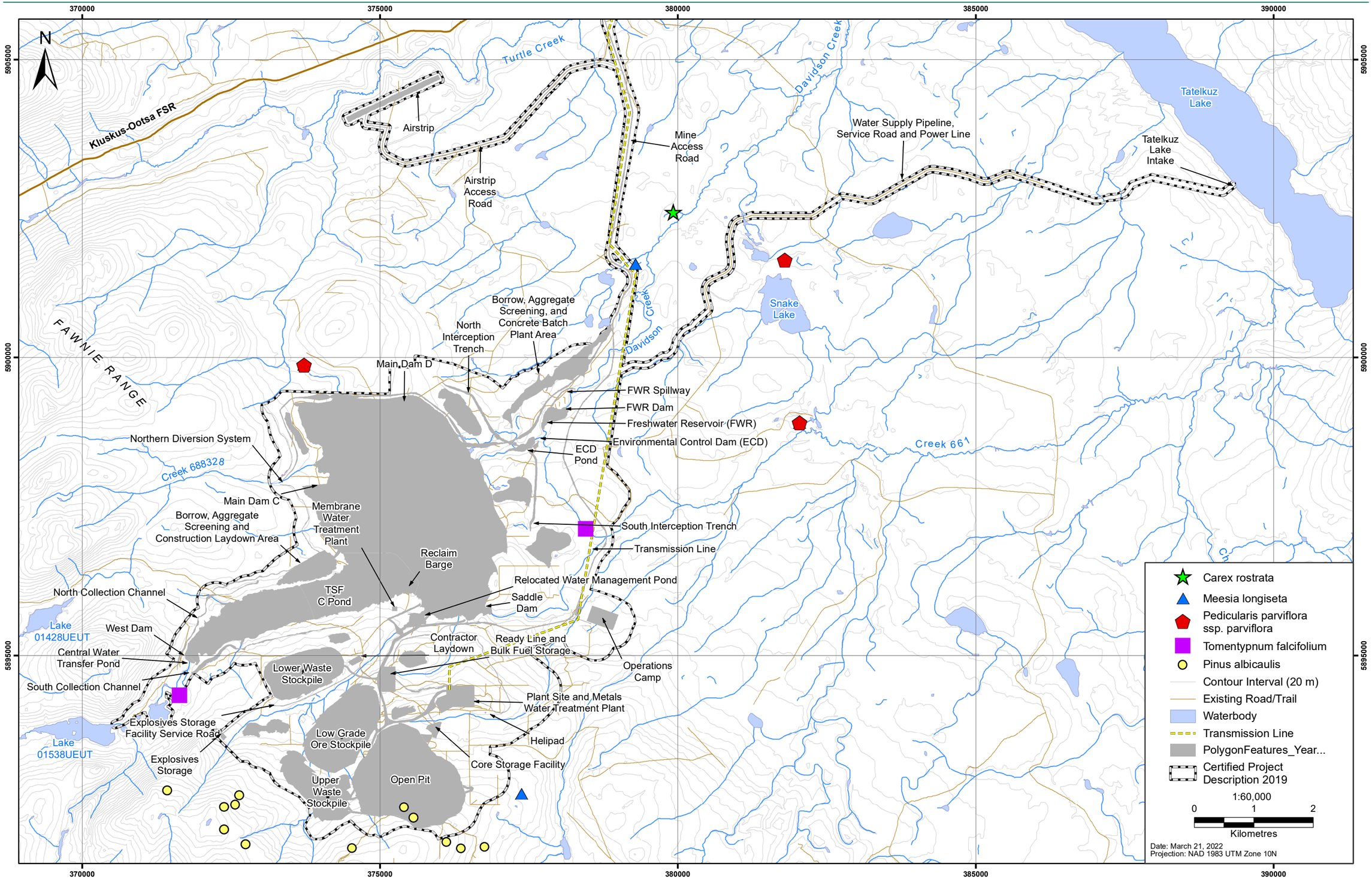

Figure 3.1-1: Documented Plant Species at Risk

- Under the direction of a qualified professional, consider plant salvage opportunities for plant species-at-risk, where practical, following Guidelines for Translocation of Plant Species-at-Risk in British Columbia[1], and re-establish in suitable natural habitats that will be undisturbed by Project activities, except for whitebark pine which will be managed in accordance with the Whitebark Pine Management Plan;
- See the Invasive Plant Management Plan for information on BW Gold's compliance with Indigenous nation herbicide use policies.;
- Comply with the Ulkatcho First Nation, Lhoosk'uz Dené Nation, Nazko First Nation, Stellat'en First Nation Stellat'en First Nation, and Nadleh Whut'en First Nation herbicide policy in their Traditional Territories;
- Reduce the impact of fugitive dust on rare plants and ecosystems at-risk through adherence to fugitive dust control measures provided in the Air Quality and Fugitive Dust Management Plan; and
- Avoid the introduction of invasive species through the implementation of the Invasive Plant Management Plan.

3.3 Operation and Closure

Pre-clearing surveys that identified and mapped listed species and at-risk-plants will be maintained for operational activities. This will be achieved with signage to notify employees of rare and species-at-risk plants and the associated management actions (with restrictions, e.g., no heavy machinery, no refueling, etc.) around these features where possible. Signs will be erected in Year +1, spaced a maximum of every 200 m along appropriate boundaries.

4. REFERENCES AND DOCUMENTS

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ERM 2021. *Blackwater Gold Project - Air Quality and Fugitive Dust Management Plan*. Prepared for BW Gold Ltd by ERM Consultants Canada Ltd, Vancouver, BC.

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ERM (In progress). *Blackwater Gold Project - Whitebark Pine Management Plan*. Prepared for BW Gold Ltd by ERM Consultants Canada Ltd, Vancouver, BC.

[1] Maslovat, C. 2009. *Guidelines for Translocation of Plant Species at Risk in British Columbia*. Prepared for Ministry of Environment Victoria, B.C.

5. REVISION, REVIEW, AND APPROVAL

Version	Date	Nature of Change	Page Inserted, Replaced, Revised, or Cancelled	Prepared By (Qualified Registered Professional)
1.0	TBD	First version of the SOP after draft was finalized	Not applicable	
2.0	April 2023	Incorporate comments from formal review	All	Rolf Schmitt

Reviewed by:

Environmental Manager

_____ _____ _____

Print Signature Date

Approved by:

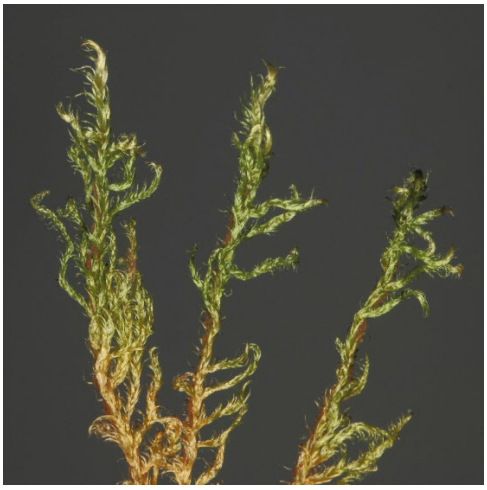
Mine Manager

_____ _____ _____

Print Signature Date

APPENDIX A SPECIES-AT-RISK DESCRIPTIONS

Appendix A: Species-at-Risk Descriptions

Common Name	Description	Photos
Whitebark pine[2]	General: Often contorted and dwarfed, 5-10 m tall, or a shrubby sprawling timberline tree, but also straight and up to 20 m; bark thin with light-whitish scales; young twigs hairy. Leaves: Needles in bunches of five, clustered toward ends of branches, (3) 4-7 cm long; yellow green. Cones: Seed cones egg-shaped, deep red to purple, (3.5) 5-8 cm long; scales remain closed and shed the seeds slowly, rarely falling from tree intact; pollen cones red.	 Photo credit: Footnote [3]
Sickleleaf tomentypnum moss[4]	General: A species of hummocks and drier habitats in poor fens, often associated with *Sphagnum angustifolium.* Plants erect to ascending, pinnately branched. Stems covered on one side with tomentum of reddish rhizoids. Leaves long lanceolate, falcate-secund, acuminate to narrowly acute, strongly plicate; costa strong and single, ending just below apex; margins entire.	 Photo credit: Footnote[5]

[2] E-Flora BC. 2021. Electronic Atlas of the Flora of British Columbia [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

[3] BC Tree Book. (https://www.for.gov.bc.ca/hfd/library/documents/treebook/whitebarkpine.htm).

[4] Vitt, D., Luth, M. 2017. A Guide to Mosses and Liverworts of Alberta Peatlands. NAIT Boreal Research Institute.

[5] Consortium of Bryophyte Herbaria. 2023. http//:bryophyteportal.org/portal/index.php. Accessed on April 03, 2023.

Common Name	Description	Photos
Mall-flowered lousewort[6]	*General:* Annual or biennial herb from a spindly taproot; stems single, ascending to erect, 10-40 cm tall, simple or more commonly branched, smooth except sometimes minutely hairy in the inflorescence. *Leaves:* Basal leaves small or lacking; stem leaves alternate, unstalked, lance-oblong, 1-5 cm long, pinnately cleft to lobed, the segments toothed or entire. *Flowers:* Inflorescences several-flowered, compact, somewhat head-like clusters at the ends of branches, often elongating and with a few lower, remote, axillary flowers, the bracts similar to the leaves but reduced upward; corollas purple or two-toned pinkish and purple, 11-17 mm long, 2-lipped, the upper lip 4-7 mm long, slightly arched, hood-like, beakless, with or more often without a pair of slender teeth near the tip, the lower lip 3-lobed, fringed with minute hairs; calyces 4-6 mm long, 2-lobed, the lobes jaggedly toothed; stamens 4, the filaments long-hairy. *Fruits:* Capsules, egg-shaped, abruptly pointy-tipped, smooth, 8-17 mm long, partly enveloped by dry expanded calyces; seeds several.	 Photo credit: Footnote [7]

[6] E-Flora BC. 2021. Electronic Atlas of the Flora of British Columbia [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

[7] Fenneman, J. 2012. Electronic Atlas of the Flora of British Columbia [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

Common Name	Description	Photos
Swollen beaked sedge[8]	General: Perennial, tufted herb from short-creeping rhizomes; stems 30-70 cm tall, triangular, smooth, except slightly rough below the inflorescence, slightly longer than the leaves. Leaves: Sheaths tight; ligules as long as wide; blades 4 to 8 per stem, borne on the lower ½ of the stem, 1.2-4.5 mm wide, folded or channelled, with silica papillae on the upper surface, cross-walled; lower leaves reduced, persistent. Flowers: Spikes 3 to 6 (8), the terminal 1 or 2, sometimes 3 or 4, linear, 1.5-5 cm long, long-stalked, with many male flowers, the lower 2 to 4 spikes cylindrical, 3-6.5 cm long, with female flowers, short-stalked, the lowermost ones spreading; bracts subtending the lowest spike leaflike, sheathless, the lowest one longer than the inflorescence. Fruits: Perigynia egg-shaped, 5-9 mm long, 1.7-3 mm wide, yellowish-green to reddish-brown, somewhat inflated, smooth, shiny, strongly nerved, rather abruptly contracted into beaks, the beaks 1.5-2 mm long, bidentate, with straight teeth; female scales lanceolate to egg-shaped, pointed, rarely awned, narrower and shorter than the perigynia, yellowish- to chestnut-brown, with lighter centres and narrow, translucent margins; stigmas 3; achenes 3-angled, 2.5-3 mm long.	 Photo credit: Footnote [9]

[8] E-Flora BC. 2021. Electronic Atlas of the Flora of British Columbia [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

[9] Kelly-McArthur, B. 2021. Electronic Atlas of the Flora of British Columbia [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

Common Name	Description	Photos
Meesia moss[10]	General: Habitat: Calcareous soil banks, rich fens, boreal, alpine, and arctic habitats, low to high elevations. Plants 0.4–0.8 cm. Stem leaves spreading and somewhat twisted when dry, irregularly spreading and indistinctly 3-ranked when moist, ovate-lanceolate to lanceolate, 2–3.5 mm; base decurrent; margins plane to weakly reflexed basally, entire; apex acute to narrowly obtuse; costa narrow, ending in or just before apex; inner laminal cells smaller, walls thicker than those of marginal cells.	 Photo credit: Footnote[11]

[10] Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico [Online]. 22+ vols. New York and Oxford. http://beta.floranorthamerica.org.

[11] Bjork, C. 2009. Electronic Atlas of the Flora of British Columbia [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

Blackwater Gold Mine

Riparian Area Management

STANDARD OPERATING PROCEDURE

April 2023 Version 2.0

Scope:	To define a standard operating procedure (SOP) for safe and efficient work practices to manage and protect riparian areas.	
Contacts:	Jack Love/Sarah Harrison Environmental Manager	jlove@artemisgoldinc.com/ sharrison@artemisgoldinc.com
Document Ownership:	Mine Manager	

1. SCOPE

This standard operating procedure (SOP) applies to all employees, contractors, and subcontractors/vendors at the Blackwater Gold Mine (Blackwater) during construction, operation and closure.

2. EXCLUSIONS

During Early Works, a minimum 30 metre (m) no-disturbance zone must be maintained around all watercourses, waterbodies, and wetlands within or adjacent to the Early Works footprint as committed to in regulatory filings. There are fundamental differences between that commitment and this SOP (i.e. disturbance within riparian area will be necessary during Construction and Operation); as such this SOP does not apply to Early Works activities.

3. RESPONSIBILITIES

Individuals with key roles and responsibilities with respect to riparian area management are presented in Table 3-1.

Table 3-1: Blackwater Roles and Responsibilities

Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, Environmental Management System (EMS) implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the General Manager.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. The CM is responsible for riparian area management during mine site construction. Reports to Mine Manager.

Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and MPs. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement and Construction Management contractor, other contractors, the Company and regulatory agencies, where required. The Environmental Manager informs the Environmental Monitors of current site conditions that may influence monitoring programs. Supports the CM and reports to Mine Manager.
Departmental Managers	Departmental Managers are responsible for implementation of this SOP relevant to their areas. Report to the Mine Manager.
Employees and Contractors	Employees are responsible for being aware of SOP requirements specific to their roles and responsibilities. Report to Departmental Managers.

4. DEFINITIONS

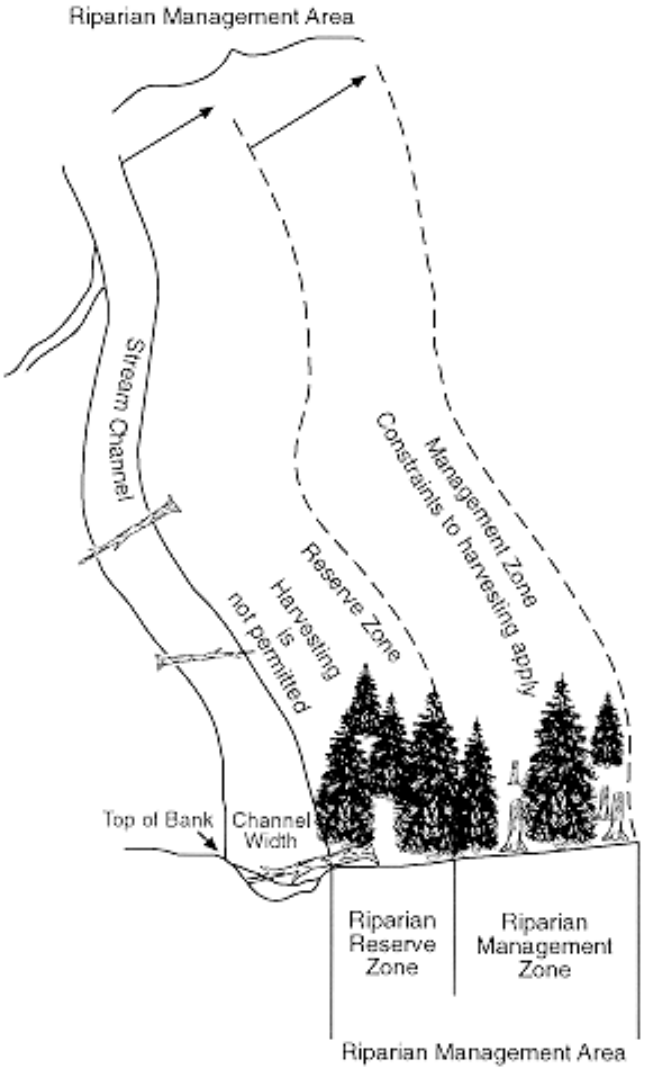
Riparian areas occur next to the banks of streams, lakes, and wetlands and include both the area dominated by continuous high moisture content and the adjacent upland vegetation that exerts an influence on it. The *Riparian Management Area Guidebook*[1] prescribes minimum riparian management area (RMA) widths for fish-bearing and non-fish-bearing streams, wetlands, and fisheries sensitive zones. There are two types of management areas associated with an RMA: Riparian Reserve Zones (RRZ) and Riparian Management Zones (RMZ). These are defined below and illustrated on Figure 4-1.

Riparian Reserve Zones: The RRZ includes the environmental value being protected and a buffer. Generally, no machine activity is permitted in RRZs unless the construction footprint occurs in this zone. This zone is designed to reduce effects on the value being protected during infrastructure construction, maintenance, and use. Avoidance of activity in this zone is the primary goal. When this is not possible, minimizing clearing widths and relocating clearing sites such as borrow pits, log lands, and waste areas is required.

Riparian Management Zone: RMZs allow more flexibility in work practices than Reserve Zones. The goal of this zone is to provide a buffer around the RRZ. Limited heavy equipment activity is permissible in this zone. Soil disturbance should be minimized through the use of low ground pressure machinery unless the construction footprint occurs in this zone. Permitted activities are described below for each RMZ. Where retention of this zone is possible, it will limit changes in microclimatic conditions such as wind, light, and temperature and reduce the potential for effects such as windthrow or invasive species colonization.

[1] BC MOF.1995. *Riparian Management Area Guidebook*. Government of British Columbia: Victoria, BC. Available at https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/silviculture/silvicultural-systems/silviculture-guidebooks/riparian-management-area-guidebook

Figure 4-1: Riparian Management Area[2]



[2] BC MOF.1995. *Riparian Management Area Guidebook*. Government of British Columbia: Victoria, BC. Available at https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/silviculture/silvicultural-systems/silviculture-guidebooks/riparian-management-area-guidebook

5. STANDARD OPERATING PROCEDURES

While the protection of the riparian area is important during all Project phases, the greatest opportunity to protect the riparian area is during construction (specifically during felling / clearing). This SOP focuses on this phase of Project development.

SOPs specific to the pre-clearing phase of activity and watercourse-specific SOPs are provided in the following sections. See also the Wetland SOP for procedures specific to working near or within wetlands.

Additional standards and best practices for working within an RRZ include:

- Health, Safety, and Reclamation Code for Mines in British Columbia (Section 9.5.1;
- Integrated Vegetation Management Plan for BC Hydro Transmission and Distribution Power Line Corridors (BC Hydro 2016);
- Approved Work Practices for Managing Riparian Vegetation (BC Hydro 2003); and
- Measures to Protect Fish and Fish Habitat (DFO 2019).

5.1 Pre-clearing

A minimum of 14 days prior to the start of felling/clearing in any new area, Site Survey will load the Project disturbance footprint, waterbody, and watercourse polygons from baseline surveys, and apply RMAs in accordance with the buffers identified in Table 5.1-1. A figure of riparian areas within the mine site is provided as Figure 5.1-1. The EM, CM, and Site Survey will review the proposed clearing limits in relation to RMAs and identify an opportunity to optimize the clearing limits, with a preference to avoid unnecessary disturbance to an RRZ outside and adjacent to the clearing limit.

Table 5.1-1: RMA Widths by Stream Class[3]

Stream Class	Mean Channel Width (m)	RRZ Buffer (m)	RMZ Buffer (m)	Total RMA Width (m)
Fish-Bearing				
S1A – large river	≥ 100	0	100	100
S1B	> 20	50	20	70
S2	> 5 ≤ 20	30	20	50
S3	> 1.5 ≤ 5	20	20	40
S4	≤ 1.5	0	30	30
Non-Fish-Bearing				
S5	> 3	0	30	30
S6	≤ 3	0	20	20

RRZ = Riparian Reserve Zone; RMZ = Riparian Management Zone; RMA = Riparian Management Area.
Construction and Operations.

[3] BC MOF.1995. *Riparian Management Area Guidebook*. Government of British Columbia: Victoria, BC. Available at https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/silviculture/silvicultural-systems/silviculture-guidebooks/riparian-management-area-guidebook

Once the final clearing limit has been determined, the CM will coordinate with Site Survey to clearly stake the RRZ and RMZ buffers around waterbodies and watercourses that lie outside the Project disturbance footprint. RMAs will also be established for waterbodies and watercourses within the Project disturbance footprint if there is opportunity to avoid or limit riparian loss (for example, streams within the transmission line right-of-way).

All stream classes require an RMZ. Streams classes S1B to S3 require both an RRZ and RMZ. Table 5.1-1 presents the RRZ and RMZ widths for fish-bearing and non-fish-bearing streams of varying sizes.

Table 5.1-2 lists general SOPs for activities within the RMA of any stream (all classes) to protect bank integrity and water quality.

Table 5.1-3 lists standard operating procedures for activities in RMAs, by stream class.

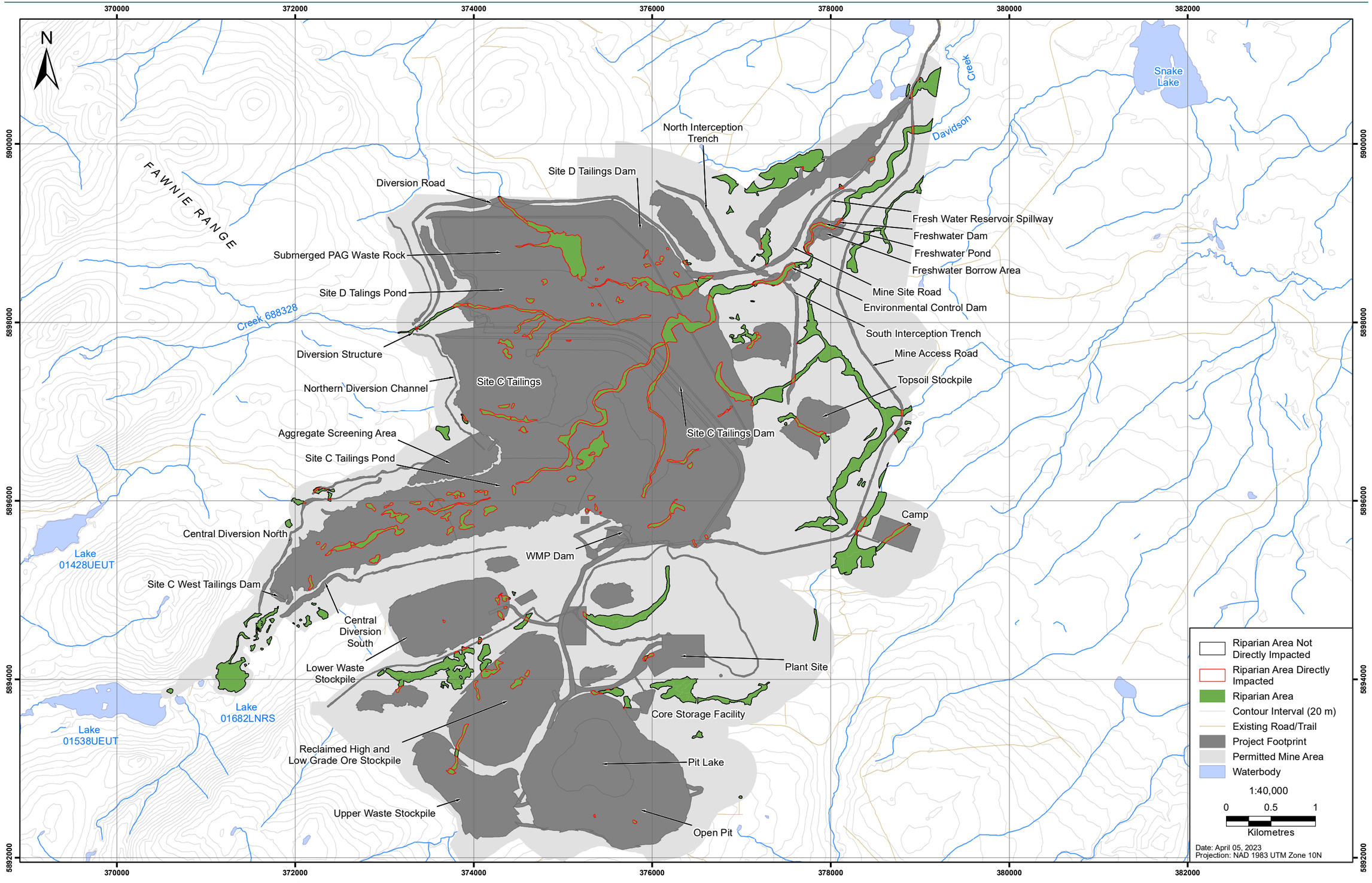


Figure 5.1-1: Riparian Area within Mine Site

Table 5.1-2: General Stream Riparian Management Area Standard Operating Procedures

Stream Class	Standard Operating Procedures
All	▪ The spatial boundary and key SOPs will be reviewed with all logging/construction staff at morning tailgate meeting(s) when working near RMAs. ▪ Fall trees away from streams wherever possible. If trees must be felled across streams for safety reasons, they should be lifted (rather than dragged) out. The removal of a tree will depend on safety of workers, access, and the opinion of the Qualified Professional. There may be cases where a felled tree can be left in a stream and in some cases the tree may present a debris accumulation/flooding hazard and will be removed. ▪ Minimize vegetation clearing within the RMZ. Implement construction practices to preserve soil integrity of stream banks at crossings and minimize bare soil exposure. ▪ BW Gold will comply with the Lhoosk'uz Dené Nation, Ulkatcho First Nation, Nadleh Whut'en First Nation, Saik'uz First Nation, Stellat'en First Nation and Nazko First Nation herbicide policy in their Traditional Territories. ▪ To protect fish and wildlife, riparian areas and wildlife habitat, herbicide application for the purpose of invasive plant management will not be used (unless a Qualified Professional has deemed it to be the only effective method of control and has been approved (by the Indigenous nation) for use in a Traditional Territory) in accordance with the Invasive Plant Management Plan. ▪ Protect natural drainages and watercourses by constructing appropriate on-site sediment control devices (including collection and diversion ditches, sediment traps, sediment ponds) and use of flocculants. ▪ Trees felled within the RRZ should be left as coarse woody debris. ▪ Within the RMZ, preference is to use heavy equipment with low pressure tires over tracked machine, unless authorized by the EM. ▪ Prevent sediment and deleterious substances from entering the stream by implementing sediment and erosion control measures in accordance with the SEPSCP. ▪ The SEPSCP will be implemented and will identify erosion control measures (e.g., proper ditching, reducing slopes and placement of soil salvage piles, diversion and runoff collection ditches, sediment control ponds, erosion control mats, and use of flocculants) (Section 7.3 of the SEPSCP). ▪ Refuelling or servicing of equipment is not allowed within RMA. In the unlikely event that equipment refuelling or servicing (machines or hand tools) may be required within an RMA (i.e., spill or equipment breakdown) then the equipment must be fully contained and an environmental monitor should be present. ▪ Use temporary crossing structures (rather than fording) to transport machinery across streams. If this is not possible, locate fords in areas with shallow, stable banks and limit crossings to once over and back (BC MFLNRO, BC MOE and DFO 2012). ▪ Machine inspections will occur daily prior to use in RMA to ensure equipment and machinery are in good operating condition, clean, and free of leaks, excess oil, and grease. ▪ Ensure all hydraulic machinery entering a stream uses environmentally sensitive hydraulic fluids that are non-toxic to aquatic life and that are readily or inherently biodegradable. This will be achieved during the risk assessment prior to executing the work and through monitoring of

Stream Class	Standard Operating Procedures
	machinery maintenance records on site (within the maintenance shop) and/or equipment log books. ▪ Minimize the clearing width at crossing sites and retain streamside vegetation within the right-of-ways wherever possible. ▪ Re-vegetate and stabilize any disturbed soil to prevent post-construction erosion in accordance with the Reclamation and Closure Plan. ▪ Design crossing structures to be perpendicular to streams to reduce the area required to be cleared. ▪ Do not remove natural debris from streams. ▪ Use temporary crossing structures (rather than fording) to transport machinery across streams. If this is not possible, locate fords in areas with shallow, stable banks and limit crossings to once over and back.

RRZ = Riparian Reserve Zone; RMZ = Riparian Management Zone; RMA = Riparian Management Area; SEPSCP = Surface Erosion Prevention and Sediment Control Plan

Table 5.1-3: Stream RRZ and RMZ SOPs

Stream Class	Standard Operating Procedures	
	Riparian Reserve Zone	Riparian Management Zone
S1-S3	▪ Refer to general riparian management area SOPs (Table 5.1-2). ▪ No activity within the RRZ other than tree harvesting and brush clearing associated with the direct Project footprint. ▪ Maintain trees and shrubs below the transmission line that meet line clearance standards. ▪ Danger trees removed for safety reasons. ▪ Top individual trees within the RRZ that have a high windthrow risk and may endanger personnel or infrastructure.	▪ Refer to general riparian management area SOPs (Table 5.1-2). ▪ Feather the outer edge of the RMZ by removing trees prone to windthrow. ▪ Top individual trees within the RMZ that have a high windthrow risk. ▪ Combine edge feathering and topping in high risk areas.

Stream Class	Standard Operating Procedures	
	Riparian Reserve Zone	Riparian Management Zone
S4	▪ Refer to general riparian management area SOPs (Table 5.1-2).	▪ Refer to general riparian management area SOPs (Table 5.1-2). ▪ Retain windfirm trees with roots embedded in the streambank. ▪ Remove dominant conifers and retain 50% of the remaining trees within 10 m of the channel. ▪ Fall and yard away from the stream and remove slash and debris from the stream. ▪ Retain understory trees (i.e., both smaller trees and underbrush growing beneath the forest canopy), and herbaceous vegetation within 5 m of the channel. ▪ Retain wildlife trees. ▪ Where windthrow is a concern, harvest as many windthrow-prone trees and retain smaller conifers for future large woody debris recruitment.
S5	▪ Refer to general riparian management area SOPs (Table 5.1-2).	▪ Refer to general riparian management area SOPs (Table 5.1-2). ▪ Valley-Bottom Streams: ▪ Retain 50% of dominant and codominant, windfirm trees throughout the RMZ. ▪ Retain understory trees (i.e., both smaller trees and underbrush growing beneath the forest canopy), and herbaceous vegetation within 10 m of the channel. and ▪ Retain wildlife trees. ▪ Non-Valley-Bottom Streams: ▪ Retain smaller conifers and deciduous trees within 5 m of the channel. ▪ Retain leaning trees within 10 m of the channel.

Stream Class	Standard Operating Procedures	
	Riparian Reserve Zone	Riparian Management Zone
S6	▪ Refer to general riparian management area SOPs (Table 5.1-2).	▪ Refer to general riparian management area SOPs (Table 5.1-2). ▪ Fall and yard away from the stream, while retaining a minimum of ten trees per 100 m of streambank. ▪ Remove slash and debris from the stream. ▪ Retain understory trees (i.e., both smaller trees and underbrush growing beneath the forest canopy), and herbaceous vegetation within 5 m of the channel. ▪ Retain and buffer wildlife trees.

RRZ = Riparian Reserve Zone; RMZ = Riparian Management Zone; RMA = Riparian Management Area

6. REFERENCES AND DOCUMENTS

BC EMLI. 2021. *Health, Safety and Reclamation Code for Mines in British Columbia*: Victoria, BC.

BC Hydro, British Columbia Transmission Corporation, MWLAP and DFO. 2003. *Approved Work Practices for Managing Riparian Vegetation*.

BC Hydro. 2016. *Integrated Vegetation Management Plan for BC Hydro Transmission and Distribution Power Line Corridors*

BC MOF.1995. *Riparian Management Area Guidebook*. Government of British Columbia: Victoria, BC. Available at https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/silviculture/silvicultural-systems/silviculture-guidebooks/riparian-management-area-guidebook

DFO. 2019. *Measures to Protect Fish and Fish Habitat*. Government of Canada.

ERM 2021. *Blackwater Gold Project - Invasive Plant Management Plan*. Prepared for BW Gold Ltd by ERM Consultants Canada Ltd, Vancouver, BC.

ERM 2021. *Blackwater Gold Project - Vegetation Management Plan.* Prepared for BW Gold Ltd by ERM Consultants Canada Ltd, Vancouver, BC.

ERM 2021. *Blackwater Gold Project - Wetland Management and Offsetting Plan*. Prepared for BW Gold Ltd by ERM Consultants Canada Ltd, Vancouver, BC.

Knight Piésold 2021. *Blackwater Gold Project - Surface Erosion Prevention and Sediment Control Plan.* Prepared for BW Gold Ltd by Knight Piésold Ltd, Vancouver, BC.

7. REVISION, REVIEW, AND APPROVAL

Version	Date	Nature of Change	Page Inserted, Replaced, Revised, or Cancelled	Prepared By (Qualified Professional)
1.0	TBD	First version of the SOP after draft was finalized	Not applicable	
2.0	April 2023	Incorporate review comments	All	Rolf Schmitt

Reviewed by:

Environmental Manager

_____	_____	_____
Print	Signature	Date

Approved by:

Mine Manager

_____	_____	_____
Print	Signature	Date

Blackwater Gold Mine

Wetlands Management

STANDARD OPERATING PROCEDURE

April 2023		Version 2.0
Scope:	To define a standard operating procedure (SOP) for safe and efficient work practices to manage and protect wetlands.	
Contacts:	Jack Love/Sarah Harrison Environmental Manager	jlove@artemisgoldinc.com/ sharrison@artemisgoldinc.com
Document Ownership:	Mine Manager	

1. SCOPE

This SOP applies to all employees, contractors, and subcontractors/vendors at the Blackwater Gold Mine (Blackwater) during construction, operation and closure. This SOP applies to all wetlands including listed wetlands.

2. EXCLUSIONS

During Early Works, a minimum 30 metre (m) no-disturbance zone must be maintained around all watercourses, waterbodies, and wetlands within or adjacent to the Early Works footprint (with the exception of bridge crossings) as committed to in regulatory filings. There are fundamental differences between that commitment and this SOP (i.e., disturbance within the wetland area will be necessary during Construction and Operation); therefore, this SOP does not apply to Early Works activities.

3. RESPONSIBILITIES

Individuals with key roles and responsibilities with respect to wetland management are presented in Table 3-1.

Table 3-1: Blackwater Roles and Responsibilities

Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, Environmental Management System (EMS) implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the Mine Manager.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. The CM is responsible for riparian area management during mine site construction. Reports to Mine Manager.

Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and MPs. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement and Construction Management contractor, other contractors, the Company and regulatory agencies, where required. Supports the CM and reports to Mine Manager.
Departmental Managers	Departmental Managers are responsible for implementation of this SOP relevant to their areas. Report to the Mine Manager.
Employees and Contractors	Employees are responsible for being aware of this SOP specific to their roles and responsibilities. Report to Departmental Managers.

4. DEFINITIONS

Wetlands are "lands that are saturated with water long enough to promote wetland or aquatic process as indicated by poorly drained soils, hydrophytic vegetation, and various kinds of biological activity adapted to a wet environment"[1]. In Canada there are five classes of wetlands (bog, fen marsh, swamp, and shallow open water) that are organized into wetland associations based on floristic and biogeochemical properties[2].

The *Riparian Management Area Guidebook*[3] prescribes minimum riparian management area (RMA) widths for fish-bearing and non-fish-bearing streams, wetlands, and fisheries sensitive zones. To reduce effects to wetlands, riparian reserve zone (RRZ) and riparian management zone (RMZ) buffers will be established around wetlands as defined in Table 4-1 and described below.

Table 8.3-2: Wetland Riparian Management Areas

Riparian Class	Wetland Size	Reserve Zone Width (m)	Management Zone Width (m)	Total RMA Width (m)
W1*	Large wetlands (> 5 ha)	50	10	40
W2	> 1 ha and < 5 ha†	30	10	20
W3	> 1 ha and < 5 ha‡	30	0	30
W4	Small wetlands (< 1 ha)§	30	0	30
W5	Wetland Complex¶	30	10	40

** No riparian reserve zone or riparian management zone extends onto any enclosed upland areas in a W1 wetland if the wetland is (a)located in a boreal, subboreal or hyper-maritime climate, and (b)greater than 1 000 ha in size;*
† and is in one of the following biogeoclimatic zones or subzones: (i)Ponderosa Pine;(ii)Bunch Grass;(iii)Interior Douglas-fir, very dry hot, very dry warm or very dry mild; (iv)Coastal Douglas-fir; (v)Coastal Western Hemlock, very dry maritime, dry maritime or dry submaritime.
‡and is in a biogeoclimatic zone or subzone other than one referred to in W2.
§not less than 0.25 ha and less than 1 ha in size and is in a biogeoclimatic zone or subzone (i)Ponderosa Pine;(ii)Bunch Grass;(iii)Interior Douglas-fir, very dry hot, very dry warm or very dry mild or not less than 0.5 ha and less than 1 ha in size and is in a biogeoclimatic zone or subzone (iv)Coastal Douglas-fir; (v)Coastal Western Hemlock, very dry maritime, dry maritime or dry submaritime.
¶ defined as two or more W1 wetlands located within 100 m of each other,(ii)a W1 wetland and one or more non-W1 wetlands, all of which are within 80 m of each other, or (iii)two or more non-W1 wetlands located within 60 m of each other, and (b)the combined size of the wetlands, excluding the upland areas, is 5 ha or larger.

Source: Division 3, subsection 48(1) of the Forest Planning and Practices Regulation.

[1] National Wetlands Working Group 1988. *Wetlands of Canada*. Sustainable Development Branch, Environment Canada, Ottawa, ON and Polyscience Publications Inc., Montreal, PQ.

[2] MacKenzie, W.H. and J.R. Moran. 2004. *Wetlands of British Columbia: A Guide to Identification*. B.C. Min. For., Res. Br., Victoria, B.C. Land Management. Handbook. 52.

[3] BC MOF.1995. *Riparian Management Area Guidebook*. Government of British Columbia: Victoria, BC. Available at https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/silviculture/silvicultural-systems/silviculture-guidebooks/riparian-management-area-guidebook.

Riparian Reserve Zones: The RRZ includes the wetland being protected and a buffer. Generally, no machine activity is permitted in a RRZ unless the construction footprint occurs in this zone. This zone is designed to reduce effects on the wetland being protected during infrastructure construction, maintenance, and use. Avoidance of activity in this zone is the primary goal. When this is not possible, minimizing clearing widths and relocating clearing sites such as borrow pits, log lands, and waste areas is required.

Riparian Management Zone: The RMZ allow more flexibility in work practices than reserve zones. The goal of this zone is to provide a buffer around the RRZ. Limited machine activity is permissible in this zone. Soil disturbance should be minimized through the use of low ground pressure machinery unless the construction footprint occurs in this zone. Permitted activities are described below for the RMZ. Where retention of this zone is possible, it will limit changes in microclimatic conditions such as wind, light, and temperature and reduce the potential for effects such as windthrow or invasive species colonization.

5. STANDARD OPERATING PROCEDURES

While the protection of wetland areas is important during all Project phases, the greatest opportunity to protect wetland areas is during construction (specifically during felling / clearing). This SOP focuses on this phase of Project development.

SOPs specific to the pre-clearing phase of activity, wetland-specific SOPs, and watercourse-specific SOPs are provided in the following sections.

5.1 Pre-clearing

Where possible, locate Project components, including roads and transmission line poles away from wetlands and riparian areas and alongside existing disturbed areas and existing infrastructure footprints. A minimum of 14 days prior to the start of felling/clearing in any new area, Site Survey will load the Project disturbance footprint, waterbody, and watercourse polygons from baseline surveys, and apply RMAs in accordance with the buffers identified in Table 4-1. A map showing the wetland area within the Mine Site is provided in Figure 5.1-1. The EM, CM, and Site Survey will review the proposed clearing limits in relation to RMAs and identify an opportunity to optimize the clearing limits, with a preference to avoid unnecessary disturbance to an RRZ outside and adjacent to the clearing limit.

Once the final clearing limit has been determined, the CM will coordinate with Site Survey to clearly stake the RRZ and RMZ buffers around wetlands that lie outside the Project disturbance footprint. A 30 m buffer of undisturbed vegetation around wetlands located within the mine site is required, excluding activities required to construct Project components. Work or activity conducted within the 30 m buffer will only be completed to the extent necessary for safety reasons to control invasive plants, or install and maintain erosion and sediment runoff control measures. An environmental monitor will observe work being done within the buffer, except when it is not possible for safety reasons.

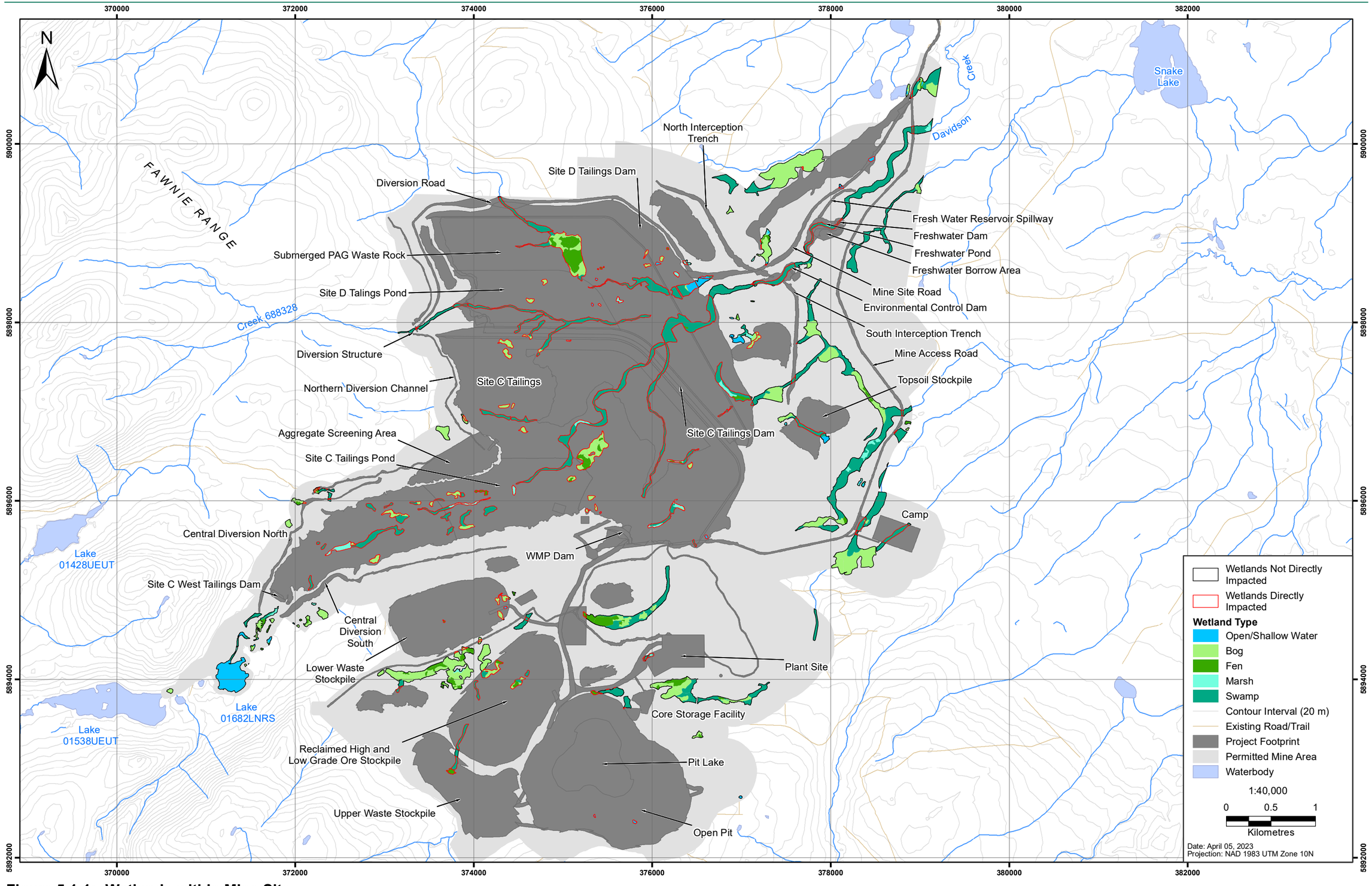


Figure 5.1-1: Wetlands within Mine Site

5.2 Construction and Operations

The SOPs that apply to all wetlands, including listed wetlands, are presented in Table 5.2-1.

Table 5.2-1: Wetland RMA Standard Operating Procedures

Activity	Standard Operating Procedures[4]
Timing	Work in or around a wetland should be scheduled when the ground is frozen (i.e., a minimum 30 cm of frost penetration is preferred). This timing will avoid affecting most of the animals that use wetlands and reduce soil compaction, rutting, and changes to site hydrology. When working in non-frozen conditions: ▪ schedule work during favourable weather and low water conditions; ▪ stop work during periods of heavy and persistent precipitation if there is a risk of sediment delivery to the wetland; and ▪ complete the work as quickly as possible by ensuring all necessary equipment and materials are on site and ready for installation to minimize the duration of the disturbance.
Clearing	Establish protected riparian areas prior to clearing at locations. Within the RMZ and RRZ: ▪ avoid construction in wetland RMZ and RRZ; ▪ use low-ground pressure machinery; ▪ limit clearing widths; ▪ debris disposal is not permitted in wetland RRZs or RMZs; ▪ relocate borrow pits, waste areas, log landings, and other cleared areas that can be feasibly constructed outside riparian management areas; ▪ minimize vegetation removal in and adjacent to wetlands; ▪ re-contour disturbed areas to restore natural cross drainages; ▪ fall trees away from wetlands. Within the RMZ: ▪ conduct wind-firming treatments to reduce windthrow risk.
Machinery	▪ Conduct work with low-ground pressure machinery (e.g., tracked equipment, all-terrain vehicles for crew travel) using portable support structures such as swamp mats where required. ▪ Machines must be checked for leaks and biodegradable hydraulic fluid must be used for work in wetland RRZs. ▪ Refuelling or servicing of equipment is not allowed within a wetland RMA or RMZ.

[4] Cox, R. and Cullington, J. 2009. *Wetland Ways: Interim Guidelines for Wetland Protection and Conservation in British Columbia.* Wetland Stewardship Partnership: n.p. Available at https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-planning-strategies/wetlands-in-bc.

Activity	Standard Operating Procedures[4]
Erosion and Sedimentation	▪ Identify areas for potential erosion and sedimentation of wetlands, and mitigate in accordance with the Surface Erosion Prevention and Sediment Control Plan. ▪ Maintain erosion prevention and sedimentation control throughout crossing construction and as required during operations. Ensure that erosion and sedimentation prevention and mitigation measures, if removed or damaged, are reinstalled or repaired as soon as possible.
Drainage	▪ Direct surface runoff from roads during grading to designed sediment control structures. ▪ Maintain or enhance existing drainage connections when designing and installing culverts for cross drainage, and avoid creating outlets that either drain wetlands or constrict the natural outlet during construction. ▪ Maintain drainage pathways and wetland hydrology by installing appropriately sized culverts for stream and wetland crossings. ▪ Avoid altering watercourses where this changes discharge into or out of wetlands. ▪ Place soil salvage stockpiles in locations where they will have no impact on natural drainages, and avoid draining into wetlands. ▪ Ensure that all water and tailings pipelines that interact with or intersect wetlands are raised enough to prevent hydrologic impacts to western toad dispersal but not raised too high that they will limit ungulate movement in and out of the wetland. The height will be determined by a Qualified Professional and will be dependent on the pipeline size, site conditions, and location, and consider the potential for access barriers (e.g., underpasses or toad salvage). ▪ Minimize pesticide and fertilizer use around aquatic resources and before precipitation events to limit chemical runoff from entering wetlands.

RRZ = Riparian Reserve Zone; RMZ = Riparian Management Zone; RMA = Riparian Management Area

6. REFERENCES AND DOCUMENTS

ERM 2021. *Blackwater Gold Project - Wetland Management and Offsetting Plan*. Prepared for BW Gold Ltd by ERM Consultants Canada Ltd, Vancouver, BC.

ERM 2021. Blackwater Gold Project - Vegetation Management Plan. Prepared for BW Gold Ltd by ERM Consultants Canada Ltd, Vancouver, BC.

ERM 2021. Blackwater Gold Project - Invasive Plant Management Plan. Prepared for BW Gold Ltd by ERM Consultants Canada Ltd, Vancouver, BC.

Knight Piésold 2021. Blackwater Gold Project - Surface Erosion Prevention and Sediment Control Plan. Prepared for BW Gold Ltd by Knight Piésold Ltd, Vancouver, BC.

7. REVIEW AND APPROVAL

Version	Date	Nature of Change	Page Inserted, Replaced, Revised, or Cancelled	Prepared By (QP)
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2.0	April 2023	Incorporate comments from formal review.	All	Rolf Schmitt

Reviewed by:

Environmental Manager

_____ _____ _____

Print Signature Date

Approved by:

Mine Manager

_____ _____ _____

Print Signature Date

Blackwater Gold Mine

Coarse Woody Debris Management

STANDARD OPERATING PROCEDURE

December 2022 Version 1.0

Scope:	To define a standard operating procedure (SOP) for safe and efficient work practices to manage coarse woody debris.	
Contacts:	Jack Love/Sarah Harrison Environmental Manager	jlove@artemisgoldinc.com/ sharrison@artemisgoldinc.com
Document Ownership:	Mine Manager	

1. SCOPE

This standard operating procedure (SOP) for coarse woody debris (CWD) management applies to all employees, contractors, and subcontractors/vendors at the Blackwater Gold Mine (Blackwater) during construction and operation. Application of coarse woody debris will be detailed in the Reclamation and Closure Plan, and as determined through reclamation trials.

2. RESPONSIBILITIES

Individuals with key roles and responsibilities with respect to riparian area management are presented in Table 2-1.

Table 2-1: Blackwater Roles and Responsibilities

Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, Environmental Management System (EMS) implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the General Manager.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. The CM is responsible for riparian area management during mine site construction. Reports to Mine Manager.
Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and MPs. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement, and Construction Management (EPCM) contractor, other contractors, the Company, and regulatory agencies, where required. Supports the CM and reports to Mine Manager.
Departmental Managers	Departmental Managers are responsible for the implementation of this SOP relevant to their areas. Report to the Mine Manager.
Employees and Contractors	Employees are responsible for being aware of this SOP specific to their roles and responsibilities. Report to Departmental Managers.

3. STANDARD OPERATING PROCEDURES

Coarse woody debris is an important habitat element and will be retained for use in reclamation. During site clearing and pre-stripping, large volumes of woody debris, some representing large pieces (logs, root wads) will be encountered. These materials can represent valuable biotic material for reclamation and surface micro-habitat creation. Under the direction of a qualified person, opportunities for salvage will be identified and coarse woody debris will be salvaged and stored for future use. Standard operating procedures for CWD management and disposal, if required, are provided in Table 3-1.

Table 3-1: Coarse Woody Debris Management Standard Operating Procedures

Debris Management	Standard Operating Procedures
Coarse Woody Debris Retention > 12 cm diameter fuels	▪ Where non-merchantable logs are available, retain approximately 50 logs or root wads per hectare (equates to approximately 10 m spacing at final application) within the area cleared for reclamation purposes (the final spacing will be determined by fire risk and the pre-clearing density of the CWD). ▪ Preferentially salvage decayed coarse woody debris over solid. ▪ Priority will be to store CWD within topsoil stockpile footprints depending on diameter and nature of the CWD. Large CWD that is not manageable within the topsoil stockpile will be stored adjacent to stockpile footprints. The Environmental Manager or designate will be responsible for coordinating the inventory with site personnel following additions to the topsoil stockpile. ▪ Establish and maintain a site-wide inventory of CWD volume available for reclamation purposes. The inventory will be completed following the completion of site clearing and pre-stripping on an annual basis, or when the material is removed from an existing storage area, with the resulting volume in storage. ▪ The Environmental Manager or designate will be responsible for coordinating the inventory with site personnel following additions to the topsoil stockpiles. The inventory will include the location of the CWD, the size of the CWD, and the amount of the CWD in each storage location.
Fine woody debris retention	▪ Priority will be to combine all fuels < 12cm in diameter (needles, tops, limbs, roots, etc.) within the topsoil stockpiles.
Fine woody debris slash loading limits < 12 cm diameter fuels	▪ Design slash loading limits to reduce surface fire spread rates, fire intensity, and fire severity and to conform to the Wildfire Act. ▪ Residual slash loading of fuels 7 to 12 cm diameter must not exceed 3 kg/m2. ▪ (30 tonnes/ha). ▪ Residual slash loading of fuels < 7 cm must not exceed 1 kg/m2 (10 tonnes/ha). ▪ Retain all stumps to reduce soil erosion and assist in revegetation efforts in areas where grading is not required.
Debris Disposal Methods	▪ Burning, chipping, and burying of woody debris are disposal methods that can be used when timber cannot be marketed or is in excess of salvage requirements. Guidance on the implementation of these methods is provided below.
Burning Material	▪ Unless exempted by an appropriate authority, all burning is to be conducted in compliance with the BC Wildfire Act and the Environmental Management Act, and Open Burning Smoke Control Regulations.

Debris Management	Standard Operating Procedures
	▪ Unless exempted by an appropriate authority, local ventilation indices must be indicated as 'good' prior to ignition of burn piles, using Environment Canada data or better information, and only continue if indices are fair or better. Wildfire Management Branch burning restrictions must be monitored and followed. ▪ Burn piles must be constructed to facilitate effective ignition and complete combustion with minimal tending by crews and must have 3 m fuel-free zones around them. ▪ No debris may be disposed of within any Special Management Zones including management zones such as flagged no-work zones, and 10 m setbacks are required from these areas, wherein no chipping or burning is permitted. One exception to this exists for burning and chipping blue-listed ecosystems but only in areas where grading of mineral soil is occurring and all native vegetation will be removed. ▪ Burning must occur in the disturbed footprint in areas that will not have native vegetation after construction. ▪ Piles must be constructed a minimum of 10 m from existing forest edges and from any reserve zones to reduce scorch and damage to retained trees. ▪ Minimize the number of piles to reduce damage to soil resources. ▪ Burning is not permitted within any Riparian Management Area(s) shown on the maps or that are located during pre-clearing surveys.
Chipping Material	▪ Chips must be distributed evenly on–site, targeting an average of 5 cm depth over the dispersal area and a maximum depth of 15 cm in any given spot. Chips may not be dispersed within reserve zones or in areas where low-lying herbaceous plants comprise the main component of understorey plants. ▪ The chipping or mulching of slash will not be permitted within the riparian management zone of any stream. In particular, chipped cedar debris will not be used for erosion control within a riparian zone as it produces a leachate toxic to fish.
Buried Material	Prior to burying, the volume of slash and overburden will first be calculated. Generally, for every cubic metre of debris, a square metre of clearing will be used for disposal. When excessive slash volumes are encountered, other disposal methods such as chipping or burning will be considered. Buried material will: ▪ be compacted before being covered with soil; ▪ be covered with a minimum of 300 mm of soil; ▪ be placed so as not to interfere with roadway or other drainage, snow removal, or design; ▪ not interfere with sight distance, future developments, or standing timber; and ▪ not interfere with any watercourse. Trenching is a type of burying in which slash and debris are placed in a trench rather than being spread over the ground surface. The volume of debris will determine the size of the trench. To minimize the size of the cleared area, a deep, narrow trench shall be used preferentially over a shallow, wide trench. To prevent undermining tree roots, 3 m of cleared width shall be left between any standing timber and the trench.

4. REVISION, REVIEW, AND APPROVAL

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2.0	April 2023	Incorporate comments from formal review	All	Rolf Schmitt

Reviewed by:

Environmental Manager

_____	_____	_____
Print	Signature	Date

Approved by:

Mine Manager

_____	_____	_____
Print	Signature	Date

Blackwater Gold Mine

Invasive Plant Management

STANDARD OPERATING PROCEDURE

April 2023 Version 2.0

Scope:	To define a standard operating procedure (SOP) for safe and efficient work practices to decrease the likelihood of invasive plant colonization.	
Contacts:	Jack Love/Sarah Harrison Environmental Manager	jlove@artemisgoldinc.com/ sharrison@artemisgoldinc.com
Document Ownership:	Mine Manager	

1. SCOPE

This standard operating procedure (SOP) applies to all employees, contractors, and subcontractors/vendors at the Blackwater Gold Mine (Blackwater) during construction, operation and closure.

This SOP is applicable to the following activities or operations that could potentially introduce or spread invasive plants at the mine site:

- Road construction and maintenance;
- Construction activities that create ground disturbance;
- Transport and usage of vehicles and machinery; and
- Re-vegetation of disturbed areas.

2. RESPONSIBILITIES

Individuals with key roles and responsibilities with respect to invasive plant management are presented in Table 2-1.

Table 2-1: Blackwater Roles and Responsibilities

Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, Environmental Management System (EMS) implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the General Manager.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. The CM is responsible for riparian area management during mine site construction. Reports to Mine Manager.
Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and MPs. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement, and Construction Management (EPCM) contractor, other contractors, the Company, and regulatory agencies, where required. Supports the CM and reports to Mine Manager.

Departmental Managers	Departmental Managers are responsible for the implementation of this SOP relevant to their areas. Report to the Mine Manager.
Employees and Contractors	Employees are responsible for being aware of this SOP specific to their roles and responsibilities. Report to Departmental Managers.

3. INVASIVE PLANT SPECIES MANAGEMENT

Control of noxious weeds and their seeds is regulated by the British Columbia (BC) *Weed Control Act*. Noxious weeds are any invasive plant species designated by regulation to be noxious under the BC *Weed Control Act* and Regulations. They can displace native vegetation and reduce wildlife habitat and forage. Invasive plants are non-native or alien to the ecosystem under consideration. Their introduction causes, or is likely to cause economic or environmental damage or harm to human health. In BC the term invasive plant is synonymous with invasive alien plant.

4. IDENTIFICATION

Sufficient training and identification resources will be supplied to the site managers including invasive plant lists and species profiles provided in the Invasive Plant Species Management Plan.

Mine personnel responsible for vegetation management will be provided with: *Best Practices for Preventing the Spread of Invasive Plants During Forest Management Activities: a Pocket Guide for British Columbia's Forest Workers, 2013 Edition*[1]

5. STANDARD OPERATING PROCEDURES

The SOPs to reduce the colonization and control of invasive plant species, are presented in Table 5-1.

Table 5-1: Invasive Plant Management Standard Operating Procedures

Invasive Plant Species Control	Standard Operating Procedures
Vehicles/ Equipment	▪ Employees and contractors will use project-designated roads and established pull-outs. ▪ Earth moving equipment and trucks are expected to be clean and free of soil and vegetation when they arrive on the mine site. ▪ Site Security will perform a visual inspection at the gatehouse for cleanliness (free of excessive dirt and debris above and beyond that reasonably expected from transport to site) on all earth-moving equipment and vehicles upon arrival to the mine site. If debris (e.g., visible dirt and plant material) is observed on earth-moving equipment or vehicles they will either be turned back for cleaning or cleaned on-site at a designated cleaning area (see IPMP Section 8.2.1). The driver will be directed to perform a final inspection to check that no clods of dirt are visible and that radiators, grills and the vehicle interior are free of mud or plant material.

[1] BC FLNRORD and ISCBC. 2013. *Best Practices for Preventing the Spread of Invasive Plants during Forest Management Activities: A Pocket Guide for British Columbia's Forest Workers.* 2013 Edition. BC Ministry of Forests, Lands and Natural Resource Operations and Invasive Species Council of BC.

Invasive Plant Species Control	Standard Operating Procedures
	▪ Any employees/contractors coming from offsite will be expected to arrive fit for duty with clean equipment, boots, and clothes. Boot brushes will be available at offices/site entrances for employees to clean off their boots prior to entry. These areas will be monitored for invasive plants as part of the routine monitoring program (IPMP Section 9). If invasive species or noxious weeds are observed at designated cleaning stations, appropriate treatment methods will be applied as indicated in IPMP Section 8.2.2. ▪ If debris is noted on clothing while working in or prior to leaving an infested area, it will be brushed off within infested area before leaving. Debris is defined as plant material, seeds, or clods of dirt that may contain invasive plant seeds or propagules. Cleaning of debris from clothing will occur away from natural watercourses and native vegetation to minimize the spread of invasive species. ▪ Keep equipment yards and storage areas free of invasive species by following best management practices outlined in the IPMP. ▪ Equipment and vehicles will not be parked in infested areas. ▪ Inspect clothing and vehicle/equipment undercarriages when working in, and prior to leaving, areas known to contain invasive plants.
Vehicle and Equipment Cleaning	▪ Upon arrival at the mine site, EM or designate inspects earth moving equipment and trucks and direct cleaning if required. ▪ Cleaning will be in designated areas using high-pressure power washers. Water will be contained to remove seeds and propagules to prevent the dispersion of invasive species on the mine site. The specific methods to contain water and/or filter to remove seeds and propagules will likely be the use of a catchment/filtration area and potentially the use of a filter cloth. Wash water will be directed towards a sump which will be periodically cleaned out, with the waste being placed in a location that would prevent seeds from germinating (e.g., deep burial, placement in the TSF, or other means). The specific method will be determined when designated cleaning areas are assigned by the Environmental Manager to meet the requirements of the Invasive Plant Management Plan. ▪ Cleaning will occur at least 30 m away from watercourses or undisturbed areas. ▪ Employees will inspect vehicle and equipment to ensure mud, soil, vegetation, and debris is removed and left at the site of infestation. ▪ If vehicles or earth-moving equipment are causing the spread of invasive plants, subject to the direction of a qualified person, a quarantine area may be established which may include blocking off the infestation, implementing treatment and control measures, and using portable wash stations.
Pre-clearing surveys	▪ Conduct pre-clearing surveys to identify invasive plant species that have been surveyed by CCIPC.1 ▪ Identify control measures to be implemented to prevent further spread through project related activities.

Invasive Plant Species Control	Standard Operating Procedures
Clearing	▪ Equipment and vehicles will not be parked in infested areas. ▪ Minimize clearing dimensions during construction to limit ground disturbance, specifically in areas with, or nearby, known invasive plant infestations. ▪ Minimize ground and soil disturbance and vegetation removal, including along road edges and outside work areas. ▪ Identify short-term disturbances of clearings and re-vegetate as soon as possible to avoid soil degradation. ▪ Maintain newly disturbed sites free of invasive plants in accordance with the Invasive Plant Monitoring SOP (Appendix G). ▪ Minimize soil erosion and degradation through adherence to the Surface Erosion Prevention and Sediment Control Plan. If straw bales are used for erosion control, only certified weed-free straws will be used. ▪ Monitor newly disturbed sites for invasive plants and promptly eradicate them.
Re-vegetation	▪ Stabilize exposed soils and promptly re-seed with native seeds mix and monitor to confirm effective vegetation recolonization. ▪ To re-vegetate roadways, use species that prevent erosion and are not wildlife attractants to prevent the establishment of invasive plants in accordance with the IPMP. Wildlife-attracting species to be avoided include legumes (family Fabaceae), brome (*Bromus* sp.), alfalfa (*Medicago sativa*), annual rye (*Lolium multiflorum*), barley (*Hordeum vulgare*), timothy (*Phleum pretense*), alpine bluegrass (*Poa alpina*), and American sloughgrass (*Beckmannia syzigachne*).
Treatment and Control Measures	▪ Determine and develop the appropriate treatment plan in accordance with Section 8.2.2 of the IPMP (i.e., consider the species status, the potential to eradicate, and the risk to native communities, sensitive ecosystems, and revegetated areas).

Notes:

EM = Environment Manager; IPMP = Invasive Plant Management Plan

[1] NWIPC. 2015. Northwest Invasive Plant Council Strategic Plan. Prince George, BC.

[2] BC MOE. 2005. Handbook for Pesticide Applicators and Dispensers. Prepared by British Columbia. Ministry of Water, Land and Air Protection, British Columbia. Environmental Management Branch.

6. REFERENCES

BC FLNRORD and ISCBC. 2013. *Best Practices for Preventing the Spread of Invasive Plants during Forest Management Activities: A Pocket Guide for British Columbia's Forest Workers.* 2013 Edition. BC Ministry of Forests, Lands and Natural Resource Operations and Invasive Species Council of BC.

BC MOE. 2005. *Handbook for Pesticide Applicators and Dispensers. Prepared by British Columbia.* Ministry of Water, Land and Air Protection, British Columbia. Environmental Management Branch.

NWIPC. 2015. *Northwest Invasive Plant Council Strategic Plan*. Prince George, BC.

7. REVISION, REVIEW, AND APPROVAL

Version	Date	Nature of Change	Page Inserted, Replaced, Revised, or Cancelled	Prepared By (Qualified Professional)
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8. REVIEW AND APPROVAL

Reviewed by:

Name (Print) Environmental Manager	Signature	Date

Approved by:

Name (Print) Mine Manager	Signature	Date

Blackwater Gold Mine

Invasive Plant Species Monitoring

STANDARD OPERATING PROCEDURE

April 2023 Version 2.0

Scope:	To define a standard operating procedure (SOP) for safe and efficient work practices for monitoring invasive plants.	
Contacts:	Jack Love/Sarah Harrison Environmental Manager	jlove@artemisgoldinc.com/ sharrison@artemisgoldinc.com
Document Ownership:	Mine Manager	

1. SCOPE

This standard operating procedure (SOP) applies to all employees, contractors, and subcontractors/vendors at the Blackwater Gold Mine (Blackwater) during construction, operation and closure.

2. OBJECTIVES

The purpose of the Invasive Plant Monitoring Standard Operating Procedure is to provide an overall monitoring plan to identify invasive plant species at all project stages and to monitor treatment effectiveness. Specific objectives are to:

- Identify invasive plant species in re-vegetated areas to ensure invasive plant species have not become established.
- Identify and document specific locations where invasive plant species are newly discovered or have been previously identified.
- Monitor the effectiveness of treatments, where treatment activities were undertaken.
- Reduce the spread of invasive plant species during monitoring.

3. RESPONSIBILITIES

Individuals with key roles and responsibilities with respect to invasive plant monitoring are presented in Table 3-1.

Table 3-1: Blackwater Roles and Responsibilities

Mine Manager	The Mine Manager, as defined in the Mines Act, has overall responsibility for mine operations, including the health and safety of workers and the public, Environmental Management System (EMS) implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to Artemis Gold's Chief Operating Officer.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. The CM is responsible for riparian area management during mine site construction. Reports to Mine Manager.

Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and MPs. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement, and Construction Management (EPCM) contractor, other contractors, the Company, and regulatory agencies, where required. Supports the CM and reports to Mine Manager.
Supervisors	Supervisors include the Construction Supervisor and Production Supervisor and are responsible for the implementation of this SOP relevant to their areas. Report to the Mine Manager.
Departmental Managers	Departmental Managers are responsible for the implementation of this SOP relevant to their areas. Report to the Mine Manager.
Employees and Contractors	Employees and contractors are responsible for being aware of the Invasive Plant Species Management Plan, SOP, including monitoring requirements, mitigation measures, adaptive management trigger action response, and reporting and record keeping.

4. EQUIPMENT

- Camera
- Hand-held GPS
- Tape measure
- Field book and pen
- Inventory data sheets[1]
- Plant identification books
- Sealable plastic bag

5. HEALTH AND SAFETY HAZARDS

- Required PPE: protective gloves, safety glasses.
- Field Safety Hazards:
  - Noxious Weeds
  - Working Remotely
  - ATV Use
  - Wildlife Encounter
  - Insect bites
  - Working in and Around Water

[1] Invasive plant surveys will be completed in accordance with the Invasive Alien Plant Program (IAPP) standardized methods: https://testwww.for.gov.bc.ca/hra/Plants/IAPP_Reference_Guide/IAPP_Reference_Guide_Part_I.pdf

6. FIELD MONITORING/COLLECTION PROCEDURES

Monitoring Timing and Duration

- Monitoring timing and duration will be in accordance with Table 9-1 of the Invasive Plant Management Plan (IPMP).
- Vegetation should be monitored close to the peak summer growth prior to the seed set, generally in the middle of July.
- Effectiveness monitoring should occur a minimum of two weeks after each treatment.
- Following treatment, the treated areas will be inspected and effort will be made to remove remaining viable seed pods before they go to ground, a second monitoring/survey should occur around August to September to prevent any missed plants from producing viable seed (may involve bagging seed heads and disposal at an appropriate waste disposal location).

Monitoring Locations

- Monitoring locations in accordance with the IPMP:
  - Pre-clearing visual surveys within confirmed clearing boundaries;
  - Known locations of invasive plant species;
  - Junction of Mine Access Road and Kluskus-Ootsa FSR;
  - Disturbed areas (roads, ditches or pond perimeters, utility corridors, trails, etc.), cleared and revegetated areas;
  - Treated areas;
  - Truck washing bay, other designated cleaning areas, equipment yards, and storage areas, Operations camp parking lot; and
  - Newly disturbed areas and not yet vegetated.

Monitoring Procedures

- Mark all survey locations on a field map prior to entering field.
- Develop a track log with GPS for plotting to show areas inventoried.
- For each invasive plant observation record the following on a Invasive Alien Plant Program (IAPP) Site & Invasive Plant Survey Record form[2]:
  - Site location
  - Date and time of observation
  - UTM coordinates at the center of the infestation
  - Plant species
  - Photograph IDs taken of each plant species collected
- If the species was found on a new site, information about the site must be recorded in addition to the data gathered during the inventory of the infestation(s).

[2] Appendix G of the Invasive Plant Management Plan (https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasive-species/iapp)

- **Site Location:** Generally, continuous invasive plant occurrences with less than a 100-m gap between plants are recorded as one site. Occurrences over 100 m apart with no target species between them are recorded as separate sites.
- **Species:** If needed to confirm the invasive plant species, collect a sample (bag and label). When a single site supports multiple invasive plant species, record all the species on that site.
- **Aerial Extent:** Assess the estimated area that the invasive species occupies in square metres. If the site is larger than 0.2 ha, make a visual estimate of the infestation:
  - Draw the infestation using reference points on the mine site plan or orthophoto at a scale of 1:5,000. These polygons can be digitized later and loaded into IAPP Site & Invasive Plant Survey Record form.
  - Or, capture the spatial data with a GPS unit by walking the perimeter of the site and downloading the polygon that is generated.
  - Or, pace the length and width of the infestation or measure with a tape measure

  Extremely large infestations (greater than 5 ha), for which creating a spatial polygon by walking the perimeter of the infestation would be impractical, can be assigned a best estimate of the total area, average density, and distribution.
- **Density:** estimate the number of plants per square metre as one of the following density classes:
  - Low (≤ 1 plant/m^2)
  - Medium (2-5 plants/m^2)
  - High (6-10 plants/m^2)
  - Dense (> 10 plants/m^2)
- **Growth Stage:** assess the growth stage as:
  - Seedling – Occurring when the first two true leaves are present to when the first bud occurs.
  - Bud – Occurs when the first flower bud is present but there are no petals visible.
  - Flower – Occurring when one flower has fully opened until the first seed head is visible.
  - Seed set – Occurring when the first seed head is visible to when the majority of seed heads are no longer present on the plant.
  - Expired – The majority of seeds or seed heads are no longer present on the plant when the plant is dead.
- **Photographs:** a photographic record should be completed at each site surveyed to observe the overall changes to the landscape over time. Photographs are taken from the four cardinal directions (north, south, east, and west) from the center of the weed infestation (where the UTM co-ordinate was taken).
- Before leaving the area after the inventory, be sure to check all clothing and travel equipment for any invasive plant parts, to avoid spreading to other areas.

Quality Assurance/Quality Control

- All persons collecting samples must be capable of identifying plant species that will be collected and will be trained on appropriate monitoring techniques to minimize the potential for cross-contamination.
- Field data sheets will be used to standardize data collection.
- Field data will be reviewed for accuracy after input into a database to minimize the potential for transcription errors.

7. REPORTING

Recorded observations and records will be updated using the IAPP Site & Invasive Plant Survey Record. Any new observations will be reported to the EM immediately and entered into IAPPs "Report-a-Weed Program", a provincial online mapping and reporting tool, by the EM or designate.

Incidental observations of invasive plant species in the field will be flagged, photographed and recorded as follows:

- Type of observation (e.g., if suspected invasive species);
- Project area (UTM coordinates if possible);
- Date of observation; and
- Name of observer.

Incidental observations will be recorded using a standard field data sheet and submitted to the EM daily. The EM will follow up on incidental observation reports within one week.

8. REFERENCE AND DOCUMENTS

BC Ministry of Forests and Range. 2010. *Invasive Alien Plant Program Reference Guide Part I*. Available at: https://testwww.for.gov.bc.ca/hra/Plants/IAPP_Reference_Guide/IAPP_Reference_Guide_Part_I.pdf

ERM. 2022. *Blackwater Gold Project: Invasive Plant Management Plan.* Vancouver, BC.

9. REVISION, REVIEW, AND APPROVAL

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10. REVIEW AND APPROVAL

Reviewed by:

Name (Print) Environmental Manager	Signature	Date

Approved by:

Name (Print) Mine Manager	Signature	Date

Appendix B: Provincial and Regional Priority Invasive Plant Species Lists

Appendix B: Provincial and Regional Priority Invasive Plant Species Lists

PROVINCIAL PRIORITY INVASIVE PLANTS

Table B-1: Provincial Priority Invasive Plant Definitions and Management Objectives

Definitions	
Prevent	Species determined to be high risk to BC and not yet established. Management objective is prevent the introduction and establishment.
Provincial EDRR	Species is high risk to BC and is new to the Province. Management objective is eradication.
Provincial Containment	Species is high risk with limited extent in B.C. but significant potential to spread. Management objective is to prevent further expansion into new areas with the ultimate goal of reducing the overall extent.
Regional Containment/Control	Species is high risk and well established, or medium risk with high potential for spread. Management objective is to prevent further expansion into new areas within the region through establishment of containment lines and identification of occurrences outside the line to control.
Management	Species is more widespread but may be of concern in specific situations with certain high values - e.g., conservation lands, specific agriculture crops. Management objective is to reduce the invasive species impacts locally or regionally, where resources are available.

Source: BC Inter-Ministry Invasive Species Working Group, 2021

Table B-2: Provincial Priority Invasive Plant Species

Category	Common Name	Genus	Species
Management	Bur chervil	*Anthriscus*	*caucalis*
Management	Carpet burweed	*Soliva*	*sessilis*
Management	Cypress spurge	*Euphorbia*	*cyparissias*
Management	Eurasian water milfoil	*Myriophyllum*	*spicatum*
Management	Gorse	*Ulex*	*europaeus*
Management	Invasive yellow hawkweeds	*Hieracium*	spp.
Management	Longspine Sandbur	*Cenchrus*	*longispinus*
Management	Mountain bluet	*Centaurea*	*montana*
Management	Purple loosestrife	*Lythrum*	*salicaria*
Management	Scentless chamomile	*Tripleurospermum*	*inodorum*
Management	Scotch thistle	*Onopordum*	*acanthium*
Management	Spurge laurel	*Daphne*	*laureola*
Management	Sulphur cinquefoil	*Potentilla*	*recta*
Management	Sweet fennel	*Foeniculum*	*vulgare*

Category	Common Name	Genus	Species
Management	Tansy ragwort	*Jacobaea*	*vulgaris*
Prevent	Camelthorn	*Alhagi*	*maurorum*
Prevent	Clary sage	*Salvia*	*sclarea*
Prevent	Common crupina	*Crupina*	*vulgaris*
Prevent	Eggleaf spurge	*Euphorbia*	*oblongata*
Prevent	Goatsrue	*Galega*	*officinalis*
Prevent	Halogeton/Saltlover	*Halogeton*	*glomeratus*
Prevent	Hydrilla	*Hydrilla*	*verticillata*
Prevent	Iberian starthistle	*Centaurea*	*iberica*
Prevent	Italian thistle	*Carduus*	*pycnocephalus*
Prevent	Johnsongrass	*Sorghum*	*halepense*
Prevent	Jointed goatgrass	*Aegilops*	*cylindrica*
Prevent	Kudzu	*Pueraria*	*montana* var. *lobata*
Prevent	Meadow Clary	*Salvia*	*pratensis*
Prevent	Mediterranean sage	*Salvia*	*aethiopis*
Prevent	Medusahead	*Taeniatherum*	*caput-medusae*
Prevent	Purple nutsedge	*Cyperus*	*rotundus*
Prevent	Purple starthistle	*Centaurea*	*calcitrapa*
Prevent	Red bartsia	*Odontites*	*serotina*
Prevent	Silverleaf nightshade	*Solanum*	*elaeagnifolium*
Prevent	Slender/Meadow foxtail	*Alopecurus*	*myosuroides*
Prevent	Slenderflower thistle	*Carduus*	*tenuiflorus*
Prevent	Spring milletgrass	*Milium*	*vernale*
Prevent	Spurge Flax	*Thymelaea*	*passerina*
Prevent	Squarrose knapweed	*Centaurea*	*virgata* ssp. *squarrosa*
Prevent	Syrian bean-caper	*Zygophyllum*	*fabago*
Prevent	Texas blueweed	*Helianthus*	*ciliaris*
Prevent	Water soldier	*Stratiotes*	*aloides*
Provincial Containment	Garlic mustard	*Alliaria*	*petiolata*
Provincial Containment	Giant hogweed	*Heracleum*	*mantegazzianum*
Provincial Containment	Poison hemlock	*Conium*	*maculatum*
Provincial Containment	Rush skeletonweed	*Chondrilla*	*juncea*
Provincial Containment	Wild chervil	*Anthriscus*	*sylvestris*
Provincial Containment	Wild parsnip	*Pastinaca*	*sativa*

Category	Common Name	Genus	Species
Provincial Early Detection Rapid Response (EDRR)	African rue	*Peganum*	*harmala*
Provincial EDRR	Black henbane	*Hyoscyamus*	*niger*
Provincial EDRR	Brazilian elodea/Waterweed	*Egeria*	*densa*
Provincial EDRR	Dyer's woad	*Isatis*	*tinctoria*
Provincial EDRR	European common reed	*Phragmites*	*australis*
Provincial EDRR	Flowering rush	*Butomus*	*umbellatus*
Provincial EDRR	Giant reed	*Arundo*	*donax*
Provincial EDRR	Invasive cordgrasses	*Spartina*	spp.
Provincial EDRR	Maltese star thistle	*Centaurea*	*melitensis*
Provincial EDRR	Mouse-ear hawkweed	*Hieracium*	*pilosella*
Provincial EDRR	North Africa grass	*Ventenata*	*dubia*
Provincial EDRR	Perennial pepperweed	*Lepidium*	*latifolium*
Provincial EDRR	Shiny geranium	*Geranium*	*lucidum*
Provincial EDRR	Slender false brome	*Brachypodium*	*sylvaticum* subsp. *sylvaticum*
Provincial EDRR	Water hyacinth*	*Eichhornia*	*crassipes*
Provincial EDRR	Water lettuce*	*Pistia*	*stratiotes*
Provincial EDRR	Yellow floating heart	*Nymphoides*	*peltata*
Provincial EDRR	Yellow starthistle	*Centaurea*	*solstitialis*
Regional Containment/Control	Blueweed	*Echium*	*vulgare*
Regional Containment/Control	Common bugloss	*Anchusa*	*officinalis*
Regional Containment/Control	Common tansy	*Tanacetum*	*vulgare*
Regional Containment/Control	Field scabious	*Knautia*	*arvensis*
Regional Containment/Control	Himalayan blackberry	*Rubus*	*armeniacus*
Regional Containment/Control	Himalayan knotweed	*Persicaria*	*wallichii*
Regional Containment/Control	Hoary alyssum	*Berteroa*	*incana*
Regional Containment/Control	Hoary cress	*Cardaria*	*draba*
Regional Containment/Control	Knotweeds (Japanese, Giant, and Bohemian)	*Fallopia/Reynoutria & Polygonum*	spp.
Regional Containment/Control	Leafy spurge	*Euphorbia*	*esula*
Regional Containment/Control	Marsh plume thistle/marsh thistle	*Cirsium*	*palustre*
Regional Containment/Control	Orange hawkweed	*Hieracium*	*aurantiacum*
Regional Containment/Control	Policeman's helmet/Himalayan balsam	*Impatiens*	*glandulifera*
Regional Containment/Control	Puncturevine	*Tribulus*	*terrestris*
Regional Containment/Control	Scotch broom	*Cytisus*	*scoparius*
Regional Containment/Control	Spotted knapweed	*Centaurea*	*stoebe*

Category	Common Name	Genus	Species
Regional Containment/Control	Teasel	*Dipsacus*	*fullonum*
Regional Containment/Control	Whiplash hawkweed	*Hieracium*	*flagellare*
Regional Containment/Control	Yellow archangel	*Lamium*	*galeobdolon*
Regional Containment/Control	Yellow flag iris	*Iris*	*pseudacorus*

Source: BC Inter-Ministry Invasive Species Working Group (2021)

** Status under review.*

REGIONAL PRIORITY INVASIVE PLANT

Table B-3: Invasive Plant Priority Ranking Descriptions

Priority Ranking	Description
1 New Invaders	Newly established species, current limited distribution, or at our borders. Expected to flourish if they become established, or if not managed. Management objective is elimination.
2 Containment	Well established species in our region, but have not yet infested all potential habitats. New sites will be managed to contain them and prevent further spread.
3 Established	Common and widespread species that occupy most or all potential habitats. Widespread control of these species is not currently possible.
4 Biological Control	Well established species in our region, for which effective biocontrol agents exist.

Source: CCCIPC (2020)

Table B-4: Priority Invasive Plant Species by Sub-Region in the Cariboo Chilcotin

Sub-Region Name	North Cariboo	Central Cariboo	South Cariboo	Nazko	Chilcotin
Regional District Electoral Areas	A, B, C	D, F	E, G, H, L	I	J, K
Baby's-Breath	1	1	1	1	1
Black Henbane[1]	1	1	1	1	1
Blueweed	1	1	1	1	1
Burdock	3	3	3	3	2
Canada Thistle	3	3	3	3	3
Caraway	1	1	1	1	1
Common Tansy	2	2	2	1	1
Dalmatian Toadflax	4	4	4	1	2[3]
Diffuse Knapweed	2	2	2	1	2
Field Scabious	2	1	1	1	1
Flowering Rush[1]	1	1	1	1	1
Himalayan Balsam	1	1	1	1	1
Hoary Alyssum	1	1	1	1	1

Sub-Region Name	North Cariboo	Central Cariboo	South Cariboo	Nazko	Chilcotin
Hoary Cress	1	1	1	1	1
Hound's-Tongue	1	1	4[5]	1	1
Knotweed Spp.	1	1	1	1	1
Leafy Spurge[2]	1	1	1	1[7]	1
Marsh Plume Thistle	1[9]	1	1	1	1
Meadow Knapweed	1	1	1	1	1
Mountain Bluet	1	1	1	1	1
Nodding Thistle	4	4	4	4	4
Orange Hawkweed	3	3	3	3	1
Oxeye Daisy	3	3	3	3	3
Perennial Pepperweed[1]	1	1	1	1	1
Plumeless Thistle	1	1	1	1	1
Purple Loosestrife	1[3]	1	1[3]	1	1
Russian Knapweed	1	1	1	1	1
Scentless Chamomile	2	3	3	2	3[3]
Spotted Knapweed	2	2[4]	2	1	2[8]
St. John's Wort[6]	2	2	2	1	1
Sulphur Cinquefoil	1	2	2	1	1
Tansy Ragwort	1	1	1	1	1
Yellow Flag Iris	1	1	1	1	1
Yellow Hawkweeds, Invasive	3	3	3	3	2
Wild Chervil	1	1	1	1	1
Wild Parsnip	1	1	1	1	1

Notes:

Blackwater Mine Site Is Located in the Nazko Sub-Region (Modified From CCCIPC 2020).

Species ranks that are in WHITE indicate the species is NOT known to exist in that sub-region. If Black, the species is present.

[1] Provincial EDRR (Early Detection Early Response) species.

[2] Biocontrol agent is present on dry sites, but not yet effective, it is effective in the TNRD near Canoe Creek.

[3] Biocontrol agent is the primary means of control.

[4] Biocontrol agent is present, but not yet effective.

[5] In the Canoe/Dog/Churn Creek areas, species is mainly controlled by biocontrol agents.

[6] Biocontrol appears to be affected by a parasite.

[7] Classified as a New Invader (1) in the Western Nazko.

[8] Grassland are at highest threat.

[9] Outside the established containment area.

REFERENCES

BC Inter-Ministry Invasive Species Working Group. 2021. *Provincial Priority Invasive Species.* https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/publications/provincial_priority_is_list.pdf (accessed August 2021).

Cariboo Chilcotin Coast Invasive Plant Committee (CCCIPC). 2020. *Invasive Plants of Concern in the Cariboo Chilcotin Educational Document & Executive Summary.* https://cccipc.ca/documents/2020_Invasive_Plant_Summary-compressed.pdf (accessed August 2021).

Appendix C: IAPP Site and Invasive Plant Survey Record

IAPP Site & Invasive Plant Survey Record

Entered into IAPP (YYYY-MM-DD):	*By:*	*Assigned Site IDs recorded on this form:* ☐

Site Created Date (YYYY-MM-DD): *

Invasive Plant Survey Date (YYYY-MM-DD): *
(only if different from Site Created Date)

Site ID: (assigned at IAPP data entry)

Site Details

Jurisdiction: * (see reverse for choices/codes)

District Lot Nr:

Range Unit:

Site Paper File ID:

UTM Zone: *

UTM Easting: * (no initial zero)

UTM Northing: * (7 digits)

Site Soil Texture:
coarse ☐ fine ☐ organic ☐

Slope:

Aspect:

Elevation (m):

Site specific use: *

Site Location (and directions how to get there):

Site Comments (anything else important /useful):

Invasive Plant Survey Details

Survey Agency: *

Employer:

Surveyor(s):

Invasive Plants * Species name or code	**Area** * Dimension or Ha	Distr. Code (see reverse for codes)	Density Code	**Survey Type** * **C**ursory /**O**perational /**P**recise	Proposed Activity Man	Chem	Bio
				C ☐ O ☐ P ☐	☐	☐	☐
				C ☐ O ☐ P ☐	☐	☐	☐
				C ☐ O ☐ P ☐	☐	☐	☐

Site Image Details

Date taken (YYYY-MM-DD): *

Reference No. *

Perspective: *
(see reverse for codes)

Image Comments:

Site Created Date (YYYY-MM-DD): *

Invasive Plant Survey Date (YYYY-MM-DD): *
(only if different from Site Created Date)

Site ID: (assigned at IAPP data entry)

Site Details

Jurisdiction: * (see reverse for choices/codes)

District Lot Nr:

Range Unit:

Site Paper File ID:

UTM Zone: *

UTM Easting: * (no initial zero)

UTM Northing: * (7 digits)

Site Soil Texture:
coarse ☐ fine ☐ organic ☐

Slope:

Aspect:

Elevation (m):

Site Location (and directions how to get there):

Site Comments (anything else important /useful):

Invasive Plant Survey Details

Survey Agency: *

Employer:

Surveyor(s):

Invasive Plants * Species name or code	**Area** * Dimension or Ha	Distr. Code (see reverse for codes)	Density Code	**Survey Type** * **C**ursory /**O**perational /**P**recise	Proposed Activity Man	Chem	Bio
				C ☐ O ☐ P ☐	☐	☐	☐
				C ☐ O ☐ P ☐	☐	☐	☐
				C ☐ O ☐ P ☐	☐	☐	☐

Site Image Details

Date taken (YYYY-MM-DD): *

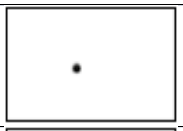
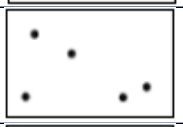
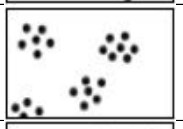
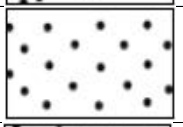
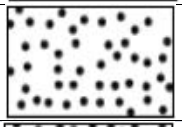
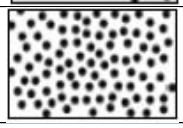
Reference No. *

Perspective: *
(see reverse for codes)

Image Comments:

** indicates mandatory field - this form may be used for 2 sites, with their invasive plant surveys, and site images (if taken).*

Some commonly used codes in IAPP:

Distribution Code		
Code	Reference	Description
1		Rare individual, a single occurrence
2		Few sporadically occurring individuals
3		Single patch or clump of a species
4		Several sporadically occurring individuals
5		A few patches or clumps of a species
6		Several well-spaced patches or clumps of a species
7		Continuous uniform occurrence of well-spaced individuals
8		Continuous occurrence of a species with a few gaps in the distribution
9		Continuous dense occurrence of a species

Density Code		
Code	Reference	Description
1	Low	≤ 1 plant/m^2
2	Medium	2-5 plants/m^2
3	High	6-10 plants/m^2
4	Dense	> 10 plants/m^2

Jurisdiction Codes	
MFR	Ministry of Forests and Range
AH	Alaska Highway
HYDR	BC Hydro
BCR	BC Rail
BCTC	British Columbia Transmission Corp.
BNSF	Burlington Northern Santa Fe
CNR	CN Rail
CPR	CP Rail
DND	Department of National Defense
GL	Grazing Lease
FN	First Nations Reserves
MN	Mining Companies
MOT	Ministry of Transportation and Infrastructure
MOE	Ministry of Environment - *except Provincial Parks*
MOP	Municipality owned land
PIPE	Oil and Gas Companies
PNG	Pacific Northern Gas
PCAN	Parks Canada
P	Private Land
PP	Provincial Parks
MRD	Regional District owned land
TEL	Telus
TER	Terasen Gas Inc.
TRP	TransCanada Pipelines
WE	Westcoast Energy Inc.

Appendix D: Indigenous Nations Herbicide Use Policies

Herbicide Use Guidance - LDN

Due to risk and impacts to human health, important Indigenous plant and wildlife, and possible contamination from spills when mixing, overfilling tanks, rinsing spray equipment near a water source, and others, pesticides will be considered a last resort for pest management on LDN Territory. Many pesticides, specifically herbicides for invasive plant management, contain a residual element that can impact seed germination and plant growth in subsequent years (the length of the residual varies for each herbicide). Therefore, the use of all pesticides on LDN Territory requires consent from LDN's Chief and Council. A memo addressing the proposed scope of work must be submitted to LDN's Chief and Council with a suggested motion for consent to pesticide use.

The document must contain:

- A clear justification of <u>why</u> other management methods are not being used
- <u>Where</u> treatments will be conducted (description and UTMs must be provided)
- <u>What</u> species are being targeted
    - Include proposed pesticide and application rate for the target species
- <u>Who</u> will be administering the treatment
    - For invasive plant management, proof of the Industrial Vegetation and Noxious Weed Pesticide Applicator certification must be provided
    - LDN request the applicator has a minimum of two years' experience in pesticide application
- <u>How</u> pesticides will be applied
- <u>When</u> treatments will take place
    - Request for motion for consent must be submitted a minimum of 4 weeks before pesticide application is scheduled

Specific pesticide labels and Material Safety Data Sheets (MSDS) for the proposed pesticide to be used must be submitted with the document. These documents will provide an all-encompassing awareness of the product that have been proposed for use in LDN Territory.

Specifically for invasive plant management, chemical treatment will be considered for the following applications:

- Large, dense infestations where mechanical or other treatments will not be effective
- Around infrastructure where natural vegetation is not desired (e.g., within the mine site at storage facilities)
- Spot treatment applications using a backpack sprayer or wicking to avoid damage to surrounding vegetation

Chemical treatment for invasive plant management will **<u>not</u>** be considered for the following applications:

- Within 100m of identified harvesting areas (e.g., near berry patches, medicinal plants, or traplines)
- Within 100m of riparian areas
    - The use of glyphosate may be considered within the mine site only

- Aerial spraying of herbicides for conifer release or other purposes
- Within operational areas (i.e., no in-block spraying)

BAND COUNCIL RESOLUTION

The Council of the			
Nadleh Whut'en Band			
Province			
British Columbia			
Place			
Nadleh Reserve			
Date	**16**	**11**	**2022**
	Day	**Month**	**Year**

DO HEREBY RESOLVE:

WHEREAS Nadleh Whut'en First Nation Chief & Council at a duly convened meeting on November 16, 2022, are in support of banning all use of herbicides within the Nadleh Whut'en First Nation Territory.

WHEREAS Nadleh Whut'en First Nation Chief & Council following the directive of Nadleh Whut'en First Nation Members and the Nadleh Whut'en First Nation Land Use Plan to "ensure that the natural environment is sustainably managed and protected for use for generations to come".

WHEREAS Nadleh Whut'en First Nation Chief & Council following the directive of Nadleh Whut'en First Nation Members and the Nadleh Whut'en First Nation Land Use Plan to "protect air quality, and surface and ground water resources for the benefit of the environment and human health and ensure these resources are available for future generations".

NOW THEREFORE BE IT RESOLVED:

1. THAT the use of herbicides conflicts with the Yinka Dene 'Uza'hne Water Management Policy also knows as the Yinka Dene Water Law.
2. THAT Nadleh Whut'en First Nation Chief & Council supports banning all use of herbicides within Nadleh Whut'en First Nation Territory.
3. THAT Nadleh Whut'en First Nation believes the use of herbicides negatively impact our Aboriginal Rights to pick medicinal plants, to fish, our ceremonial lives and our hunting rights.

Chief Martin Louie

Councillor Damien Ketlo

Councillor Mark Lacerte

Councillor Ashley Heathcliff

Councillor Eleanor Nooski

Councillor Roy Nooski

A quorum for this Band consists of 4

SAIK'UZ FIRST NATION

P: 250.567.9293 | F: 250.567.2998
135 Joseph Street, Vanderhoof, BC, V0J 3A1
www.saikuz.com

RESOLUTION OF THE COUNCIL OF THE SAIK'UZ FIRST NATION

WHEREAS Saik'uz First Nation Chief & Council at a duly convened meeting on October 25, 2022, are in support of banning all use of herbicides within Saik'uz First Nation Territory

AND WHEREAS Saik'uz First Nation Chief & Council following the directive of Saik'uz First Nation Members and oral history of our late Elders who recognize our responsibility to protect the land and its resources for future generations.

AND THAT Saik'uz First Nation Chief & Council following the directive of Saik'uz First Nation Members and oral history that honors Saik'uz Whut'enne's connection to the land, waters, resources, and features of the natural environment that provide for member's physical and spiritual needs.

THEREFORE BE IT RESOLVED THAT:

a) Saik'uz First Nation Chief and Council hereby declares a ban on all use of herbicides within Saik'uz First Nation Traditional Territory.
b) Saik'uz First Nation believes that the use of herbicides negatively impacts our Aboriginal Rights to pick medicinal plants, our ceremonial lives, and our hunting and fishing rights.
c) The use of herbicides conflicts with the Yinka Dene 'Uza'hné Water Management Policy also known as the Yinka Dene Water Law.

A quorum for the Saik'uz First Nation Council is three (3) Councillors.	**Saik'uz First Nation COUNCIL MEETING HELD AT:**		*135 Joseph Street, Vanderhoof, B.C.*	
	DATED:		October 25 2022	
	MOVED BY:	Alison Johny	**SECONDED BY:**	Jasmine Thomas

Chief Priscilla Mueller ◆ Councillor Alison Johnny ◆

Councillor Jackie Thomas ◆ Councillor Jasmine Thomas ◆ Councillor Rodney Teed ◆

#20221025A2

STELLAT'EN FIRST NATION
BOX 760, FRASER LAKE BC V0J 1S0—PHONE (250) 699-8747 - FAX (250) 699-6430
www.stellaten.ca

Band Council Resolution 2022.12.07.01

Ban the use of herbicides in Stellat'en First Nation Territory

WHEREAS Stellat'en First Nation Chief & Council at a duly convened meeting on October 27, 2022, are in support of banning all use of herbicides within Stellat'en First Nation Territory.

WHEREAS Stellat'en First Nation Chief & Council following the directive of Stellat'en First Nation Members and the Stellat'en First Nation Community Plan "recognizes its responsibility to protect the land and it's resources for future generations".

WHEREAS Stellat'en First Nation Chief & Council following the directive of Stellat'en First Nation Members and the Stellat'en First Nation Community Plan "Honors its connection to the land, resources, and features of the natural environment that provide for its members physical and spiritual needs".

NOW THEREFORE BE IT RESOLVED:

1. **THAT** Stellat'en First Nation Chief and Council supports banning all use of herbicides within Stellat'en First Nation Traditional Territory.

2. **THAT** Stellat'en First Nation believes that the use of herbicides impacts our Aboriginal Rights to pick medicinal plants, to fish, they negatively affect our ceremonial lives, and they also impact our hunting rights.

3. **THAT** The use of herbicides conflicts with the Yinka Dene 'Uza'hné Water Management Policy also known as the Yinka Dene Water Law.

Executed this 27th day of October 2022 in the Province of British Columbia at Stellaquo I.R #1.

Robert Michell
Chief

Kenneth Schmidt
Councilor

Clifford Louis
Councilor

Walter Ward
Councilor

Yvonne George
Councilor

Appendix E: Bio-Geoclimatic Units Within the Transmission Line Right-of-Way

Table E-1: Bio-geoclimatic Units within the Transmission Line Right-of-Way - ESSFmv1

Bio-geoclimatic Unit	Map Code[1]	Site Series	Site Series Name	Final Right-of-Way (ha)[2]
ESSFmv1	FF	3	Subalpine fir - Huckleberry - Feathermoss	-
	FG	4	Subalpine fir - Huckleberry - Gooseberry	0.4
	FH	5	Subalpine fir - Glow moss	-
	FR	1	Subalpine fir - Rhododendron - Feathermoss	2.2
	LC	2	Lodgepole pine - Huckleberry - Cladonia	-
	RZ	RZ	Road	0.1
ESSFmv1 Total				**2.7**

Source ERM (2017)

[1] Map Code refers to mapping provided in the reference document (Blackwater Gold Project – Consolidated Ecosystem Composition and Plant Species and Ecosystems at Risk Valued Components Effects Assessment, ERM 2017).

[2] Includes the proposed new alignment and Stellako Re-route. Totals do not include wetlands, lakes, rivers, or ponds.

Table E-2: Bio-geoclimatic Units within the Transmission Line Right-of-Way - SBSdk

Bio-geoclimatic Unit	Map Code[1]	Site Series	Site Series Name	Final Right-of-Way (ha)[2]
SBSdk	BF	3	Lodgepole pine - Feathermoss - Cladina	15.1
	BW	82	Sandberg's bluegrass - Slender wheatgrass	0.3
	CD	8	Black cottonwood - Dogwood - Prickly Rose	-
	CF	CF	Cultivated Field	-
	DS	4	Douglas fir - Soopolallie - Feathermoss	1.2
	GP	GP	Gravel Pit	0.8
	LJ	2	Lodgepole pine - Juniper - Ricegrass	2.2
	LU	LU	Lowbench Floodplain	-
	RO	RO	Rock	0.2
	RZ	RZ	Road	5.1
	SF	5	Hybrid white spruce - Spirea - Feathermoss	18.1
	SH	7	Hybrid White Spruce - Horsetail	7.5
	SI	1	Hybrid White Spruce - Spirea	113.7
	ST	6	Hybrid white spruce - Twinberry - Coltsfoot	29.2
	SW	81	Saskatoon - Slender wheatgrass	0.3
	TA	TA	Talus	0.1
SBSdk Total				**193.8**

Source ERM (2017)

[1] Map Code refers to mapping provided in the reference document (Blackwater Gold Project – Consolidated Ecosystem Composition and Plant Species and Ecosystems at Risk Valued Components Effects Assessment, ERM 2017).

[2] Includes the proposed new alignment and Stellako Re-route. Totals do not include wetlands, lakes, rivers, or ponds.

Table E-3: Bio-geoclimatic Units within the Transmission Line Right-of-Way – SBSdw3

Bio-geoclimatic Unit	Map Code[1]	Site Series	Site Series Name	Final Right-of-Way (ha)[2]
SBSdw3	CF	CF	Cultivated Field	-
	DC	2	Douglas fir - Lodgepole pine - Cladonia	-
	GP	GP	Gravel Pit	-
	LC	3	Lodgepole pine - Feathermoss - Cladina	-
	RO	RO	Rock	-
	RZ	RZ	Road	0.2
	SH	9	White Spruce - Horsetail - Glow moss	0.5
	SO	8	Hybrid white spruce - Oakfern	0.1
	SP	1	Hybrid white spruce - Douglas fir - Pinegrass	14.5
	SR	4	Hybrid white spruce - Douglas fir - Ricegrass	1.2
	SS	6	Hybrid white spruce - Pink Spirea – Prickly rose	-
	ST	7	Hybrid white spruce - Twinberry	14.5
SBSdw3 Total				**31.0**

Source ERM (2017)

[1] Map Code refers to mapping provided in the reference document (Blackwater Gold Project – Consolidated Ecosystem Composition and Plant Species and Ecosystems at Risk Valued Components Effects Assessment, ERM 2017).

[2] Includes the proposed new alignment and Stellako Re-route. Totals do not include wetlands, lakes, rivers, or ponds.

Table E-4: Bio-geoclimatic Units within the Transmission Line Right-of-Way – SBSmc2

Bio-geoclimatic Unit	Map Code[1]	Site Series	Site Series Name	Final Right-of-Way (ha)[2]
SBSmc2	BM	3	Black spruce - Lodgepole pine - Feathermoss	1.7
	HB	4	Hybrid white spruce - Huckleberry – Dwarf blueberry	0.7
	HG	11	Sxw - Horsetail - Glow moss	0.6
	PH	2	Lodgepole pine - Huckleberry - Cladonia	3.4
	RZ	RZ	Road	1.8
	SB	1	Hybrid white spruce - Huckleberry	38.9
	SH	10	Hybrid white spruce - Horsetail	0.7
	SL	9	Hybrid white spruce - Devil's club	0.5
	SO	6	Hybrid white spruce - Oak fern	5.5
	ST	8	Hybrid white spruce - Twinberry - Oak fern	1.5
	TC	5	Hybrid white spruce - Twinberry - Coltsfoot	5.6
	UR	UR	Urban	-
SBSmc2 Total				**60.9**

Source ERM (2017)

[1] Map Code refers to mapping provided in the reference document (Blackwater Gold Project – Consolidated Ecosystem Composition and Plant Species and Ecosystems at Risk Valued Components Effects Assessment, ERM 2017).

[2] Includes the proposed new alignment and Stellako Re-route. Totals do not include wetlands, lakes, rivers, or ponds. Totals do not include wetlands, lakes, rivers, or ponds.

Table E-5: Bio-geoclimatic Units within the Transmission Line Right-of-Way – SBSmc3

Bio-geoclimatic Unit	Map Code[1]	Site Series	Site Series Name	Final Right-of-Way (ha)[2]
SBSmc3	BF	6	Black spruce - Lodgepole pine - Feathermoss	-
	BH	5	Black spruce - Huckleberry - Spirea	3.8
	GP	GP	Gravel Pit	-
	LF	3	Lodgepole pine - Feathermoss - Cladina	4.5
	LJ	2	Lodgepole pine - Juniper - Dwarf huckleberry	0.2
	RO	RO	Rock	-
	RZ	RZ	Road	2.3
	SB	1	Hybrid white spruce - Huckleberry	38.6
	SH	8	Hybrid white spruce - Horsetail	1.6
	SS	4	Hybrid white spruce - Huckleberry - Soopolallie	1.2
	ST	7	Hybrid white spruce - Twinberry	9.3
	UR	UR	Urban	-
SBSmc3 Total				**61.5**

Source ERM (2017)

[1] Map Code refers to mapping provided in the reference document (Blackwater Gold Project – Consolidated Ecosystem Composition and Plant Species and Ecosystems at Risk Valued Components Effects Assessment, ERM 2017).

[2] Includes the proposed new alignment and Stellako Re-route. Totals do not include wetlands, lakes, rivers, or ponds.

Appendix M Transmission Line Industrial and Domestic Waste Management Plan

ARTEMIS GOLD INC | Blackwater Mine

Transmission Line Industrial and Domestic Waste Management Plan

Table of Contents

List of Tables

Work Instructions

Transmission Line Industrial and Domestic Waste Management Plan

Version	H.1
Replaces	G.1
Creation Date	09/04/2023
Scheduled Review Date	
Review Date	
Document Team Members	
Document Owner:	
Document Approver:	
Related Documents:	
Key Contacts:	
Change Requests:	

Acronyms and Abbreviations

Indigenous Nations	Lhoosk'uz Dené Nation, Ulkatcho First Nation, Nadleh Whut'en First Nation, Stellat'en First Nation, Saik'uz First Nation and Nazko First Nation as defined by EAC M#19-01
Artemis	Artemis Gold Inc
BC	British Columbia
Blackwater	Blackwater Gold Project
BMP	Best Management Practice
BW Gold	BW Gold LTD.
CCN	Cheslatta Carrier Nation
CEO	Chief Executive Officer
CEPA	Canadian Environmental Protection Act
CM	Construction Manager
CMSTHP	Chemicals and Materials Storage, Transfer and Handling Plan
COO	Chief Operating Officer
Code	Health, Safety and Reclamation Code for Mines in British
CSFN	Columbia Carrier Sekani First Nations
DS	Decision Statement
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
ECCC	Environment and Climate Change Canada
ELoMC	Environmental Life of Mine Committee
EM	Environmental Manager
EMBC	Emergency Management British Columbia
EMLI	Ministry of Energy, Mines and Low Carbon Innovation
EMP	Environmental Management Plan
EMPR	Ministry of Energy Mines and Petroleum Resources Environmental
EMS	Management System
ENV	Ministry of Environment and Climate Change Strategy
EPC	Engineering, Procurement and Construction contractor
FOR	Ministry of Forests
FSR	Forest Service Road
FRPA	Forest and Range Practices Act
GM	General Manager

ha	Hectare
JAIR or Joint MA/EMA Application	Joint Application Information Requirements for Mines Act and Environmental Management Act Permits
HWR	Hazardous Waste Regulation
Km	Kilometre
L	Litre
LDN	Lhoosk'uz Dené Nation
LOO	Licence of Occupation
M	Metre
MAR	Mine Access Road
MP	Management Plan
MOE	Ministry of Environment
MOF	Ministry of Forests
NFN	Nazko First Nation
NWFN	Nadleh Whut'en First Nation
OHS	Occupational Health and Safety
Project	Blackwater Gold Project
QP	Qualified Professional
RoW	Right-of-Way
SFN	Saik'uz First Nation
SOP	Standard Operating Procedure
StFN	Stellat'en First Nation
TDG Act	Transportation of Dangerous Goods Act
TDGR	Transportation of Dangerous Goods Regulation
TL	Transmission Line
TLFMSCP	Transmission Line Fuel Management and Spill Control Plan
TL IDWMP	Transmission Line Industrial and Domestic Waste Management Plan
TL IPD	Transmission Line Initial Project Description
TL WMP	Transmission Line Wildfire Management Plan
TN	Tŝilhqot'in Nation
UFN	Ulkatcho First Nation
VP	Vice President
WHMIS	Workplace Hazardous Materials Information System
WMMP	Wildlife Mitigation and Monitoring Plan

1.0 Project Overview

The Blackwater Gold Project (the Project) is a gold and silver open pit mine located in central British Columbia (BC), approximately 112 kilometres (km) southwest of Vanderhoof, 160 km southwest of Prince George, and 446 km northeast of Vancouver. The Project site is presently accessed via the Kluskus Forest Service Road (FSR), the Kluskus-Ootsa FSR and an exploration access road, which connects to the Kluskus-Ootsa FSR at km 142. Electrical power for the Project will be supplied by a new approximately 135 km and up to 140 m wide corridor, 230 kilovolt overland transmission line (TL) that will connect to the BC Hydro grid at the Glenannan substation located near the Endako mine, 65 km west of Vanderhoof. A brief description of the proposed TL is as follows:

- From the Glenannan substation to the mine site permit area, the TL will be permitted by way of Licence of Occupation (LOORoW;
- The TL will be constructed within a cleared right of way (RoW) of 40 metre (m) width for standard spans, but up to 50 m width for longer spans in select areas. The TL RoW area is approximately 541 ha for the entire length of 135 km ha;
- Existing permitted and non-status roads will be used for the purpose of accessing the RoW. New access trails and stream crossings will be located only within the TL cleared RoW;
- Equipment and material laydown areas will also lie within the cleared RoW; and
- The construction workforce will be housed at the Project camp or other independent commercial accommodations in the area.

  Overall Project construction is anticipated to take two years. The TL is anticipated to take approximately 14 months to construct. Post-construction, most of the temporary access trails used for construction on the TL RoW will be deactivated and/or decommissioned within 3 years except for those required for maintenance. During operation of the TL there will be periodic inspections and maintenance as well as occasional unscheduled power supply interruptions that will require inspection and maintenance/repair activities.

Once commissioned, the TL will be required to support mine development through operations and mine closure.

The mine site is located within the traditional territories of Lhoosk’uz Dené Nation (LDN), Ulkatcho First Nation (UFN), Skin Tyee Nation and Tsilhqot'in Nation. The Kluskus and Kluskus-Ootsa Forest Service Roads (FSRs) and Project TL crosses the Traditional Territories of Nadleh Whut’en First Nation (NWFN), Saik’uz First Nation (SFN), and Stellat’en First Nation (StFN; collectively, the Carrier Sekani First Nations) as well as the Traditional Territories of the Nazko First Nation (NFN), Nee Tahi Buhn Band, Cheslatta Carrier Nation and Yekooche First Nation (EAO 2019a and 2019b).

Additional details on TL components and activities are presented in Section 3.2 of the Transmission Line Initial Project Description (TL IPD; BW Gold 2022).

2.0 Purpose, Objectives, and Scope

2.1 Purpose

The purpose of the Transmission Line Industrial and Domestic Waste Management Plan (TL IDWMP; or 'the Plan') is to describe waste management strategies to be followed during the transmission line (TL) Construction and Operations phases for the Blackwater Gold Project (the Project). The Transmission Line Industrial and Domestic Waste Management Plan (TL IDWMP) support applications for Crown land tenure (i.e., Statutory RoW, LOO) under the Land Act and is also required under the Forest and Range Practices Act (FRPA), and the Occupational Health and Safety (OHS) Regulation. The Plan does not consider tree waste as part of the management strategy, as tree waste is considered in the TL Wildfire Management Plan. The Plan describes the management of anticipated hazardous and non-hazardous industrial and domestic waste generated from TL activities. The Plan describes how BW Gold will comply with regulatory obligations, commitments, and best management practices during this work and the plan is to be adopted by all employees and contractors associated with the TL.

2.2 Objectives and Scope

The objectives of this TL IDWMP are to:

- Provide procedures and mitigations measures to manage industrial and domestic waste during the construction and operations phase of the TL;
- Ensure compliance with regulatory requirements;
- Minimize waste sent to landfills;
- Ensure employees and contractors are aware of their responsibilities and requirements.

The scope of this Plan includes all TL construction and operation activities and is a standalone document. It includes the collection, storage, handling, transportation, recycling, and disposal of waste. The scope of the Plan is to inform policies and procedures for relevant personnel and contractors. The Plan is supplementary to, and does not replace or override, any relevant Government legislation, and associated Regulations.

2.3 Related Documents

The TL IDWMP is linked (shares common elements or is intended to read in conjunction) with other environmental management plans including the TL Construction Environmental Management Plan (December 2021), Wildlife Mitigation and Monitoring Plan (November 2021), and the Fuel Management and Spill Control Plan (November 2021). The Chemicals and Materials Storage, Transfer and Handling Plan (CMSTHP) dated November 2021 was developed to support the Major Works application and establishes procedures for storing, transferring, and handling chemicals and substances classified or deemed as potentially hazardous products, including toxic chemicals and substances, and dangerous goods. The reader is referred to the CMSTHP for information on hazardous wastes and materials not included in the TL IDWMP.

3.0 Roles and Responsibilities

BW Gold has an obligation to meet previous commitments and delegate responsibilities associated with those commitments to mine personnel and site contractors during all phases of the mine life. A clear understanding of the roles, responsibilities, and level of authority that employees and contractors have when working at offsite infrastructure such as the Transmission Line as addressed by this plan, is essential to meet EMS objectives. Table 3-1 provides an overview of general environmental management responsibilities during all phases of the mine life for key positions that will be involved in environmental management. Other positions not specifically listed in Table 3-1 but who will provide supporting roles include independent Environmental Monitors, other qualified persons, and qualified professionals (QPs).

Table 3-1: Blackwater Roles and Responsibilities

Position	Responsibility
Chief Executive Officer (CEO)	The CEO is responsible for overall Project governance. Reports to the Board.
Chief Operating Officer (COO)	The COO is responsible for engineering and Project development and coordinates with the Mine Manager to ensure overall Project objectives are being managed. Reports to the CEO.
Vice President (VP) Environment & Social Responsibility	The VP is responsible for championing the Environmental Policy Statement and Environmental Management System (EMS), establishing environmental performance targets and overseeing permitting. Reports to the COO.
General Manager (GM) – Development	The GM is responsible for managing project permitting, the Project's administration services and external entities, and delivering systems and programs that ensure Artemis's values are embraced and supported: Putting People First, Outstanding Corporate Citizenship, High Performance Culture, Rigorous Project Management and Financial Discipline. Reports to the COO.
Mine Manager (MM)	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, EMS implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the GM.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. Reports to the GM.
Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and management plans. The EM or designate will be responsible for reporting non-compliance to the CM, the Engineering, Procurement and Construction (EPC) contractor, the Engineering, Procurement and Construction Management (EMCM) contractor, other contractors, the Company, and regulatory agencies, where required. Supports the CM and reports to the Mine Manager.
Departmental Managers	Departmental Managers are responsible for implementation of the EMS relevant to their areas. Reports to the Mine Manager.

Position	Responsibility
Indigenous Relations Manager	Indigenous Relations Manager is responsible for Indigenous engagement throughout the life of mine. Also responsible for day-to-day management and communications with Indigenous groups. Reports to the VP Environment & Social Responsibility.
Communications Coordinator	The Communications Coordinator is responsible for developing communication processes and procedures during potential mine emergency situations as well as establishment and testing of communication systems. Reports to the Indigenous Relations Manager.
Community Relations Advisor	Community Relations Advisor is responsible for managing the Community Liaison Committee and Community Feedback Mechanism. Reports to Mine Manager.
Environmental Monitors	Environmental Monitors (includes Environmental Coordinators and Technicians) are responsible for tracking and reporting on environmental permit obligations through field-based monitoring programs. Report to the EM.
Aboriginal Group Monitors	Aboriginal Group Monitors are required by EAC #M19-01 Condition 17 and will be responsible for monitoring for potential effects from the Project on the Indigenous interests. Aboriginal Monitors will be involved in adaptive management and follow-up monitoring programs. Report to the EM
Employees and Contractors	Employees and contractors are trained and are responsible for being aware of permit requirements specific to their roles and responsibilities. Report to Departmental Managers.
Qualified Professionals and Qualified Persons	Qualified professionals and qualified persons will be retained to review objectives and conduct various aspects of environmental and social monitoring as specified in Environmental and Social Management Plans.

BW Gold will employ a qualified person as Environmental Manager (EM) who will ensure that throughout the TL Construction phase, the EMS requirements are established, implemented and maintained, and that environmental performance is reported to management for review and action. The EM is responsible for retaining the services of qualified persons or QPs with specific scientific or engineering expertise to provide direction and management advice in their areas of specialization. The EM will be supported by a staff of Environmental Monitors that will include Environmental Specialists and Technicians and a consulting team of subject matter experts in the fields of environmental science and engineering.

During the TL Construction phase, BW Gold will be entering into multiple EPC contracts, likely for the TL, Process Plant, Tailings and Reclaim System, and 25kV Power Distribution. Each engineer/contractor will have their own CM and there will be a BW Gold Construction Manager and/or Superintendent who ultimately reports to the GM Development. The EPC contractors will report to the CMs who will ultimately be responsible for ensuring that impacts are minimized, and environmental obligations are met during the Construction phase. For non-EPC contractors, who will perform some of the minor works on site, the same reporting structure, requirements, and responsibilities will be established as outlined above. BW Gold will maintain overall responsibility for management of the construction phase of the TL and will therefore be responsible for establishing employment and contract agreements, communicating environmental requirements, and conducting periodic reviews of performance against stated requirements.

The CM is accountable for ensuring that environmental and regulatory commitments/obligations are being met during the construction phase. The EM will be responsible for ensuring that construction activities are proceeding in accordance with the objectives of the EMS and associated management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and EPC or EPCM contractor, other contractors, the Company and regulatory agencies, where required. The EM or designate will have the authority to stop any construction activity that is deemed to pose a risk to the environment; work will only proceed when the identified risk has been addressed and concerns rectified.

Environmental management during operation of the Project will be integrated under the direction of the EM, who will liaise closely with Departmental Managers and will report directly to the Mine Manager. The EM will be supported by the VP of Environment and Social Responsibility in order to provide an effective and integrated approach to environmental management and ensure adherence to corporate environmental standards. The EM will be accountable for implementing the approved management plans and reviewing them periodically for effectiveness. Departmental area managers (e.g., mining, milling, and plant/site services) will be directly responsible for implementation of the EMS and management plans/standard operating procedures) relevant to their areas. All employees and contractors are responsible for daily implementation of the practices and policies contained in the EMS.

During closure and post-closure staffing levels will be reduced to align with the level of activity associated with these phases. Prior to initiating closure activities, BW Gold will revisit environmental and health and safety roles and responsibilities to ensure the site is adequately resourced to meet permit monitoring and reporting requirements. The Mine Manager will maintain overall responsibility for Closure and Post-closure activities.

Pursuant to Condition 19 of the EAC #M19-01, BW Gold has established an Environmental Life of Mine Committee (ELoMC) to facilitate information sharing and provide advice on the development and operation of the Project, and the implementation of EAC conditions, in a coordinated and collaborative manner. Committee members include representatives of the Environmental Assessment Office (EAO), UFN, LDN, NWFN, StFN, SFN, NFN, Ministry of Energy, Mines and Low Carbon Innovation (EMLI), ENV Ministry of Environment and Climate Change Strategy (ENV) and Ministry of Forests, Lands, Natural Resource Operations and Rural Development.

Pursuant to Condition 17 of the EAC #M19-01, Aboriginal Group Monitor and Monitoring Plan, BW Gold will retain or provide funding to retain a monitor for each Indigenous nation defined in the EAC #M19-01 prior to commencing construction of the TL and during the TL's active maintenance activities and decommissioning. The general scope of the monitor's activities will be related to monitoring for potential effects from the Project on the Indigenous nations' interests.

The TL EPC or EPCM contractor roles and responsibilities relating to environmental management, industrial and domestic waste management, and environmental protection are identified below in Table 3-2.

Table 3-2: Transmission Line Construction Contractor Roles and Responsibilities

Role	Responsibility
Contractor Construction Manager (CCM)	The Contractor Construction Manager (CCM) has ultimate responsibility for construction proceedings, including worker and public health and safety and environmental protection. The CCM will ensure the implementation of training programs as well as support the Blackwater Gold Environmental Policy. The CCM will ensure that adequate support and resources are made available for the implementation and maintenance of the Environmental Management System, including the management plan implementation and review. The CCM may, as needed, delegate their duties to Qualified Professionals. Report to the BW Gold Construction Manager.

Role	Responsibility
Contractor Construction Superintendents	The Contractor Construction Superintendents have an administrative responsibility and requirement to act upon the directions, guidance, and support of the CCM. They are resources to the CCM, and have the following responsibilities: • Support the implementation of the Blackwater Gold Environmental Policy; • Ensure that environmental matters are given consideration in pre-planning of construction activities, budgets, training, and operations; and • Ensure that workers under their supervision are made aware of known, or reasonably foreseeable, environmental aspects where they work.
Construction Employees, Contractors, and Sub-Contractors	Employees have general responsibilities for environmental protection, which include: • Supporting the Blackwater Gold Environmental Policy; • Supporting implementation of Environmental Management Plans; • Cooperating with the Blackwater Environmental Monitoring Committee representative(s); • Learning and following environmental best practices and procedures relevant to their work; • Following instructions and directives given by supervisors; • Operating equipment in an environmentally responsible manner to avoid environmental impacts; • If training another worker, ensuring that they are properly completing all required tasks and responsibilities in accordance with environmental best practices procedures; • Reporting all environmental incidents immediately to their supervisor, who will expedite a response to address the incident; • Participating in mitigating or minimizing harm to the environment should an environmental incident occur; and • Asking for help or information when unsure how to perform a task without compromising social, cultural, archaeological, or environmental values.

4.0 Compliance Obligations, Guidelines, and Best Management Practices

The TL IDWMP is consistent with requirements in the *Environmental Management Act*, FRPA, the *Wildfire Act*, Wildfire Regulations, and OHS Regulations.

Copies of relevant acts, regulations, and permits will be kept on file at site, and an overview understanding of their regulation will be given to TL site personnel as part of their training. Federal and provincial legislation guiding waste management includes the following acts and regulations.

4.1 Legislation and Regulations

4.1.1 Federal

Federal legislation and regulations relevant to the TL construction include:

- *Canadian Environmental Protection Act* (1999);

- *Canadian Environmental Assessment Act* (2012);
- Environmental Emergency Regulations;
- *Impact Assessment Act*;
- *United Nations Declaration on the Rights of Indigenous Peoples Act*;
- *Canada Transportation Act* (Government of Canada, 1996);
- *Transportation of Dangerous Goods Act* (federal TDG Act) (Government of Canada, 1992), which includes the Transportation of Dangerous Goods Regulation (federal TDGR) Government of Canada, 2001);
- *Hazardous Products Act* (Government of Canada, 1985e), including the Controlled Products Regulations (Government of Canada, 2010);
- CEPA, 1999 (Government of Canada, 1999), including the Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (2005), and the Interprovincial Movement of Hazardous Waste Regulations (Government of Canada, 2002);
- *Canada Water Act* (Government of Canada, 1985a); and
- Canada Labour Code, including the Canada Occupational Heath and Safety Regulations (Government of Canada, 2012).

4.1.2 Provincial

Provincial legislation and regulations relevant to the TL construction include:

- *Transport of Dangerous Goods Act* (BC TDG Act; Government of BC, 1996m), which includes the Transport of Dangerous Goods Regulation (BC TDGR) (Government of BC, 1985);
- *Environmental Management Act* (Government of BC, 2003b), Chapter 53 (Sewage, Air, Refuse, and Special Waste Regulations (Government of BC, 1988)), including the Hazardous Waste Regulation (HWR) (Government of BC, 2009), the Spill Reporting Regulation (Government of BC, 2008), and the Contaminated Sites Regulation (Government of BC, 2011);
- *Health Act* (Government of BC, 1996b), Chapter 9;
- Health, Safety and Reclamation Code for Mines in BC (Government of BC, 2008), *Mines Act* (Government of BC, 1996c), Chapter 293, including the Workplace Hazardous Materials Information System Regulation (Mines; Government of BC, 2005);
- *Workers Compensation Act* (Government of BC, 1996g), including the Occupational Health and Safety Regulation (Government of BC, 2012);
- *Forest and Range Practices Act*;
- *Lands Act*;
- *Declaration on the Rights of Indigenous Peoples Act*;
- *Environmental Assessment Act*;
- *Environmental Management Act*, including the Municipal Wastewater Regulation;
- *Mines Act*;
- *Public Health Act;* and
- *Wildfire Act.*

4.2 Guidelines and Best Management Practices

In addition to relevant legislation and regulations, several best management practices and guidelines have been considered during the development of this Plan or its supporting management plans. These documents include:

- *Industrial Camp Fact Sheet – Industrial Camps Waste Authorization and Best Practices* (ENV 2018);
- *Guidelines for Industrial Camps Regulation*, Section 22 (MOH, 2017);
- *A Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia* (FLNRO 2014); and
- *Occupational Health and Safety Regulations*.

5.0 Support

5.1 Training and Awareness

All those responsible for the management, implementation, and operation of any aspect of this plan will be competent for their role. All staff will attend Site Orientation where the contents, requirements and commitments made in this plan will be communicated. At a minimum, the Site Orientation will include the following topics with respect to waste management:

- An overview of the TL Project's waste management approach;
- Employee responsibilities with respect to proper waste management; and
- An awareness of wildlife attractants.

Staff will be adequately trained for their roles to implement this plan and will be aware of BW Gold's commitments to uphold this plan. Training will cover safety and measures to mitigate effects on ecosystems, soils, and vegetation and to emphasize the importance of following and implementing the TL IDWMP.

Site supervisors will be provided with a copy of the TL IDWMP and will receive additional training with respect to the requirements that are outlined in the form of operational standard operating procedures (SOPs). Targeted training related to waste management will be provided to individuals and/or groups of workers assuming a specific authority or responsibility related to waste handling, storage, and disposal.

BW Gold will regularly review and update the training and awareness plan based on changes in training needs and regulatory requirements.

Employee education and outreach on waste management will be supported by:

- Development and delivery of educational material to site personnel; and
- Maintaining updated information related to waste management at Blackwater in a location available to employees.

Prior to the commencement of work on the TL Project, all personnel will:

- Have reviewed and be aware of the requirements of this plan;
- Be aware of their legislative requirements, specifically including but not limited to:
  - WHMIS, Safety Data Sheets, and Transportation of Dangerous Goods.

5.2 Internal and External Communication

5.2.1 Internal Communication

Environmental incidents for potential non-compliance or actual non-compliance with applicable regulations, legislation, or guidelines / best management practices will be:

- Reported by construction staff to their supervisors, who will adequately log and document the incident;
- Reported immediately to the BW Gold CM and EM by the Contactor Construction Manager; and
- Document and file all incidents of potential or actual non-compliance in a manner that is acceptable to the BW Gold EM.

5.2.2 External Communication

The BW Gold EM is responsible for communicating with applicable regulatory authorities after receiving the initial report, (e.g., Ministry of Environment (MOE)) depending on the reporting threshold and environmental impact of an incident.

5.2.3 Safety Meetings and Inspections

Contractors and subcontractors are required to hold regular documented safety meetings at a frequency agreed to by the BW Gold CM. Safety meetings must focus discussion on hazards and risks specific to the work being performed and recent incidents within the workplace. Additionally, as a minimum, discussions will include past meeting concerns, findings from workplace inspections, and reported near misses. These include conditions associated with waste management facilities and practices.

The BW Gold CM or designate will regularly attend Contractor's safety meetings to reinforce their commitment to safety, provide opportunities for direct contact with site personnel, and monitor that the quality of meetings are adequate.

These meetings include but are not limited to:

- Daily crew talks;
- Daily *Safe Act* Observations (SAOs) by supervisors;
- Daily Risk Assessment Inspection of work areas;
- Weekly management meetings; and
- Monthly management meetings.

6.0 Environmental Protection Measures

6.1 Waste Management Process

All industrial and domestic waste will be removed from the TL site and deposited at an approved waste or recycling facility.

Waste from the site clearing process (non-commercially viable timber and brush) will be either used for restoration purposes after construction, removed from site, burnt, or buried. The management of tree waste is dealt with in the TL Wildfire Management Plan.

Domestic waste including food and non recyclable food packaging are considered to be potential wildlife attractants and need to be stored indoors or in the cabs of vehicles until they can be transported to an approved facility for landfilling or incineration.

Management of the waste groups will apply a waste hierarchy procedure adopted as TL Project policy, as follows:

- Avoid/Reduce – take action to reduce or avoid waste generation;
- Reuse/Recycle – reuse or recycle wastes where practical; and
- Treat/Dispose of wastes appropriately – treat or dispose of waste in an environmentally responsible manner that meets regulatory requirements and manages environmental liabilities appropriately.

Only a small quality of waste generated during the TL construction activities is anticipated to be regulated as hazardous materials. This does not include waste oil or batteries, which are dealt with under in sections 6.2.1 and 6.2 respectively. Any other hazardous materials will be transported to the minesite and managed under the Chemicals and Materials Storage, Transfer and Handling Plan (CMSTHP). The CMSTHP was developed to establish procedures for storing, transferring, and handling chemicals and substances classified or deemed as potentially hazardous products, including toxic chemicals and substances, and dangerous goods that will be used and produced during the Construction, Operations, Closure and Post-closure phases. The plan is required by section 9.16 of the Joint Application Information Requirements for *Mines Act* and *Environmental Management Act* Permits (EMPR & ENV 2019).

6.2 Recycling Policy

BW Gold's corporate policy will support active involvement of all site personnel and contractors in achieving the environmental goals of waste minimization, materials conservation, and recycling. Recyclables will be disposed of in the following manner:

- Scrap iron and steel will be placed in designated and marked bins.
- Scrap copper will be stockpiled separately, as it is of greater value than steel and iron. Copper wire and brass scrap will be placed in designated and marked scrap copper bins.
- Mixed recyclables include paper, cardboard, glass, tins, aluminum cans, and plastics. Plastics with the recycling marks 1, 2, 3, 4, 5, 6, and 7 can be recycled. Recyclables will be placed in designated and marked recycling bins located throughout the site. Since waste may contain food residues, these bins will be equipped with wildlife exclusion measures, such as clamping lids.
- Vehicle batteries must be stored on a containment pallet or in designated bins and held for pickup by a licensed contractor.
- General domestic use battery types (alkaline, NiCad, etc.) will be placed in designated and marked bins.
- Fluorescent lights (tubes/CFL) will be placed in a designated and marked bin and held for pickup and removal to a specialized recycling facility.
- Printer ink or toner cartridges will be placed in designated and marked containers in various office locations.
- Mobile phones and electronic equipment (e-waste) may contain recyclable materials. E-waste will be placed in designated and marked containers for recycling.
- Metal drums that cannot be reused (e.g., for storage of used fuel filters) will be crushed and disposed of as scrap metal.

- Plastic drums with a recycling mark numbered 1,2, 4, or 5 will be rinsed out and placed in designated and marked recycling bins. Rinsate, if not hazardous, will be placed in the TSF; otherwise disposed of as hazardous waste. Oil-contaminated plastic containers will be disposed of as hazardous waste.
- All Recyclables will be transported by the EPC Contractor to facilities such as the Vanderhoof Recycling Depot or the Vanway Regional Transfer Station in Prince George.

Some recyclables of economic value may be backhauled off site in outgoing delivery vehicles and donated to a local charity. A designated recycling program would be established to accommodate this and will include separation of key recyclables that are part of the BC deposit/refund program.

6.2.1 Recycling of Oils and Hydrocarbon Fluids

Guidelines for the disposal of hydrocarbon wastes are shown below in Table 6.2-1.

Table 6.2-1: Hydrocarbon Wastes

Waste Description	Storage Actions and Location	Disposal Method
Used Oil	• Includes waste lubricating oils from service vehicles, mobile or stationary equipment, generators, and pumps. • Stored in empty bulk lubricant cubes. • Cubes will be stored at a designated transfer site.	• Consider reusing clean waste oil as incinerator fuel (if specifications are met). • Excess waste oil, or waste oil not fit for combustion, will be backhauled to the product supplier or to a registered hazardous waste receiver for recycling.
Hydraulic Fluid	• Transferred to clearly labelled, tightly sealed, sound containers, such as steel drums, and grouped for storage at a designated waste transfer site.	• Hydraulic Fluid will be backhauled to the product supplier or to a registered hazardous waste receiver for recycling.
Used Oil and Fuel Filters	• Waste oil and fuel filters must be drained prior to disposal. • The filters will then be crushed to release additional oil and reduce disposal volume. • Placed in clearly labelled, tightly sealed, sound containers, such as steel drums, located a designated waste transfer site. • Full drums or oily waste bins will be stored at a designated waste transfer site.	• Crushed and stored in drums. • Excess will be backhauled to supplier or registered hazardous waste receiver.
Empty Petroleum Hydrocarbon Containers and Drums	• Empty bins, drums, or pails will be stored at a designated waste transfer site.	• Returned to the supplier during the backhaul; or • Remove to landfill if deemed “empty”.

Waste Description	Storage Actions and Location	Disposal Method
Hydrocarbon Contaminated Debris and Soil from Spills	• Contaminated soil bins will be strategically placed at laydown areas and/or other designated waste transfer sites for use in temporary storage of small amounts of contaminated soils until such soil can be removed or treated. • Small Spills, less than 5 litres, may be treated on site	• Tested and removed off site by a hazardous waste service provider to an approved disposal or recycling facility where a plan will be developed for its treatment. • Oil Gator, or a similar product, will be applied to the spill in accordance with the Manufacturers recommendations.

These guidelines will be updated when wastes and waste quantities are specifically characterized. At that time, wastes will be checked for potential control under the federal *TDG Act* and *TDGR*. For example, certain hazardous wastes such as batteries and waste oil may not be dangerous goods under the *TDG Act* and *TDGR,* and waste oil used for fuel must not exceed limits specified in the *HWR* for several substances (e.g., total arsenic, total cadmium).

The Contractor will obtain a hazardous waste generator number based on the anticipated quantities of hazardous wastes temporarily stored on site.

6.3 Transmission Line Construction Facilities

It is anticipated that there will be minimal facilities at the TL during construction. Facilities will be temporary and will be placed at designated locations within the approved TL Right of Way and will include a limited number of office trailers, lunchroom trailers, wash trailers, storage trailers, and seacans.

Food waste and packaging will be stored in a designated locations within the lunch trailers. The waste will be removed daily to minimize odours and promote hygiene. Recyclable wastes will be segregated at these locations in labelled containers for transport off site.

On site shops for the purpose of mobile vehicle maintenance are not anticipated, as vehicular maintenance will occur by means of mobile maintenance vehicles or in off site facilities.

During construction, temporary outdoor waste transfer areas (WTA) will be established at designated locations within the approved TL RoW to temporarily store inert waste materials destined for offsite disposal until a qualified contractor(s) transports the material to the appropriate facilities. The transfer areas will be designed to store only a small quantity of scrap iron and steel, scrap copper, and mixed recyclables (no food wastes or packaging). Small quantities of hazardous or regulated wastes such as waste oil, vehicle batteries, domestic use batteries, electronic waste, and fluorescent bulbs will be stored as per instructions provided in Section 6.2 within enclosed and lockable trailers or seacans until the waste can be safely transported off site.

6.4 Transportation of Waste Materials

As TL equipment is serviced onsite, a large volume of waste oils and fluids are produced. These fluids are prohibited from being stored on site and must be transported back to an appropriate off-site storage or disposal facility at the end of each shift. Service trucks will be equipped with an oil evacuation system that is designed to drain, evacuate and transfer used oil to a holding tank on the service truck. These fluids will then be transported in a manner that prevents the inadvertent release of wastes or recyclables. All waste

and recyclables will be transported from the site according to the most recent amendment of pertinent regulations, such as the provincial TDGR, and the following practices.

Timing for waste and recycling haul will be optimized to consider the following safety and environmental factors:

- Weather conditions;
- Road conditions and congestion; and
- Identified restricted activity periods.

Only TL Project-approved waste management or site services personnel will transport waste or recycling in vehicles designated and approved for this transport. Hazardous waste will be transported under contract by a Project-approved transporter licensed under the *HWR.* Criteria for approval are:

- Knowledge of emergency spill response and reporting procedures. The procedure requires that all personnel have access to the TLFMSCP, which includes medical and environmental emergency contact information, spill response procedures, and incident reporting procedures.
- Emergency spill response equipment carried on vehicles (e.g., shovels, spill kits of appropriate size and content).
- Fire extinguisher and fire prevention materials carried on vehicle.
- Communications equipment and knowledge of communications procedures.

The following transportation measures will be adhered to:

- Non-compatible materials will be transported in separate containers; and
- Manifests will be maintained in compliance with the TDGR and *HWR*.

Details for the transport: identification of waste, including routing restrictions, waste pickup schedule and waste tracking and documentation requirements for waste identification, pickup, delivery, and chain of custody will be confirmed with the waste services provider, as appropriate, before waste is transported. Spill prevention, notification, and response procedures will be provided in the TLFMSCP.

Waste will be transported to final approved disposal facilities in a manner that prevents the inadvertent release of wastes or recyclables. All waste will be transported from the site according to the most recent amendment of pertinent regulations, such as the provincial *TDGR*, and the following practices:

- Non-compatible materials will be transported in separate containers; and
- Manifests will be maintained in compliance with the TDGR and *HWR*.

Details for the transport: identification of waste, including routing restrictions, waste pickup schedule, and waste tracking and documentation requirements for waste identification, pickup, delivery, and chain of custody will be confirmed with the waste services provider, as appropriate, before waste is transported. Spill prevention, notification, and response procedures will be provided in the TLFMSCP.

6.4.1 Transportation Documentation

Transportation of all hazardous and non-hazardous waste from the site will be recorded and documented to account for all waste materials. These records will be completed by the waste services provider. The proponent will collect and retain copies of transportation documentation on a monthly basis. Documentation from transportation of hazardous waste will be compiled into a Hazardous Waste manifest and be maintain for at least two years.

The information provided on the manifest form, in addition to vehicle labels and placards, is also intended to assist first responders (police, ambulance, and fire department) with hazard information should an accident occur in transit. If all or part of a hazardous waste shipment is lost during transportation (as by a truck accident), the carrier will immediately notify the manager or designate, and the proponent's environmental department. Reports for on-site and off-site spills will be completed by the carrier or waste services provider and reviewed with BW Gold management.

7.0 Discharges during Construction and Operations

7.1 Refuse

Discharges associated with refuse are presented in Table 7.1-1. Under the *Environmental Management Act*, "*refuse" means discarded or abandoned materials, substances or objects*. It includes domestic and industrial non-hazardous waste.

Table 7.1-1: Refuse Discharge Sources during Transmission Line Construction and Operations

	Construction	Operations	Decommissioning
Refuse	• Domestic non-hazardous waste (including food waste and packaging) originating from TL facilities and construction activities. • Industrial waste resulting from construction and maintenance of TL infrastructure and equipment/vehicle maintenance.	• Domestic waste non-hazardous waste from the TL will not be generated during the operations phase. • A comparatively minor quantity of Industrial waste resulting from maintenance and repair of TL infrastructure.	• Industrial waste resulting from decommissioning of TL infrastructure (including treated wood and metal) and equipment/vehicle maintenance.

7.1.1 Industrial Waste

Combustible (non-putrescible) wastes such as clean, untreated wood waste will be incinerated or burned through strictly controlled open burning (assuming permits are obtained and conditions are favourable) consistent with provincial authorizations. Pallets will be stockpiled and reused wherever possible. Pallets that cannot be reused will be incinerated or burned through strictly controlled open burning (assuming permits are obtained and conditions are favourable). The burning of untreated wood & lumber, pallets, paper products and cardboard would emit primarily particulates, but any impacts would be limited to areas near the burn. If burning is prohibited combustible materials will be sent to an offsite landfill.

Non-combustible solid wastes are those that cannot readily burn and those that are not suitably disposed of through burning. These materials will be stored temporarily in designated waste transfer areas. Wastes such as scrap metal, and unsalvageable equipment will be sorted in steel recycle bins for either onsite reuse or offsite recycling / disposal.

Bulk wastes that cannot be recycled, or incinerated will be hauled to an approved offsite landfill. This waste may consist of treated wood, rubber, non-recyclable scrap metal, and machinery parts (cleaned of any petroleum residues), construction debris, and plastic. Table 7.1-2 identifies options for disposal of these materials.

Industrial wastes will be generated throughout the TL construction phase. There will be little to no industrial wastes generated during the TL operations phase.

Table 7.1-2: Non-combustible Solid Wastes

Waste Description	Storage Actions and Location	Disposal Method
Tires	• Store temporarily in designated waste transfer areas located within the TL RoW.	• Temporarily reuse and recycle (e.g., reuse tires for haul road berms, turning area, road protection, and as bunks for laydown of stock material). At the end of TL construction all tires temporarily reused for other purposes within the TL RoW will be hauled off site for recycling/disposal.
Glass	• Stored in labelled bins.	• Reuse and recycle. • Non-reusable and non-recyclable glass (windows etc.) will hauled to an approved landfill.
Plastics (not including food waste packaging)	• Stored temporarily in labelled bins located in designated waste transfer areas within the TL RoW.	• Reuse and recycle. • Non-reusable and non-recyclable plastic containers that originally contained non-hazardous materials, not including food products, will be hauled to an approved landfill.
Scrap metal	• Restock and reuse scrap metal pieces for other projects where possible. • Stored in waste transfer areas located within the TL RoW.	• Reuse, recycle, and resale where possible.
Welding rods	• Stored in labelled scrap steel bins located in waste transfer areas within the TL RoW.	• Recycle via an approved offsite facility.
Electronic and electrical equipment	• Electronics waste will be collected and stored in watertight containers. • Placed in dry storage.	• Reuse and recycle.

7.1.2 Domestic Waste

Some minor domestic waste from lunch and office trailers will be generated by the work force during the construction phase only. Domestic wastes will be collected in garbage bags within lunch trailers and will be sent off site daily for disposal in an authorized licenced landfill or incinerator. Plastics will be separated at source for the purpose of recycling.

Food, food-covered packaging, and other combustible (non-recyclable) office wastes will be collected and stored in sealed, wildlife-resistant containers. Options for disposal of these wastes are shown in Tables 7.1-3 and 7.1-4**.**

Table 7.1-3: Putrescible Waste

Waste Description	Storage Actions and Location	Disposal Method
Food waste and packaging collected from lunch room trailers, office trailers and vehicles.	• Store indoors in garbage bags within larger bins as required.	• Employees and contractors will be encouraged to use reusable bottles for water, coffee and beverages (pending COVID protocols). • Food waste and packaging will be stored in plastic bags, collected, and transported daily to an offsite landfill or incinerator to minimize attracting wildlife and to promote hygiene.

Table 7.1-4: Combustible (Non-putrescible) Wastes

Waste Description	Storage Actions and Location	Disposal Method
Corrugated cardboard	• Use bulk-shipped when possible to reduce cardboard packaging volumes.	• Reused as packaging for backhauled materials. • Recycled. • If soiled, incinerated or transported to offsite landfill.
Paper	• Have printers set to use both sides of paper when printing or photocopying. • Encourage use of online viewing. • Specific containers will be set up in offices and common rooms on site to collect waste paper.	• Collected and burned through strictly controlled open burning (assuming permits are obtained and conditions are favourable). • Shipped off site for recycling or landfill.
Waste lumber	• Promote restocking and reusing lumber products for future projects or as backhaul packaging. • Place in appropriate collection bin.	• Collected and burned through strictly controlled open burning (assuming permits are obtained and conditions are favourable). • Shipped off site for recycling or landfill.

7.2 Contaminated Soil Management

There are currently no contaminated soils on the TL Project site. During construction, there is potential for spills of hydrocarbons, anti-freeze, solvents, lubricants and/or glycol. Spill response is addressed in the Spill Response Plan (TL Fuel Management and Spill Control Plan and Major Works Fuel Management and Spill Control Plan). Depending on the size of the spill, excavation may require heavy equipment.

Contaminated snow will be hauled off site and disposed at the Mine Site through the truck wash bay oil/water separator.

Hydrocarbon-impacted soils will be either hauled to the mine-site or an approved off-site facility for treatment and disposal. If hauled to the mine-site the contaminated soil will be processed in accordance with the Spill on Land, Major Works FMSCP.

Records will be maintained of all spills during construction and operation so that when the TL is finally reclaimed, clean-up concerns will be addressed. Any monitoring associated with potential contaminated sites will be addressed in the overall Project Post-closure monitoring plan.

8.0 Monitoring, Measurement, Analysis, and Evaluation

8.1 Monitoring

Waste monitoring includes the visual inspection of the main components of the waste management system and the measurements and recording of all wastes (recycled or otherwise disposed) taken off site including:

- Type and quantities of waste transported;
- Location and name of disposal or recycling facility; and
- Date that each was hauled off-site.

Wastes shipped off-site will be recorded using an Off-Site Disposal Log or equivalent that will be developed prior to the start of construction.

Inert solid waste will be stored in a manner that minimizes the opportunity for windblown debris and animal attraction.

Waste audits will be undertaken at generation points to ensure waste streams are properly segregated.

8.2 Quality Assurance / Quality Control

Quality assurance / quality control procedures will be followed during surveys and monitoring. Field data sheets will be used to standardize data collection. All data will be transferred to a database and will be reviewed prior to finalization. All persons conducting surveys will be trained on appropriate monitoring techniques to standardize field methods.

9.0 Reporting and Record Keeping

9.1 Reporting

During the construction phase, BW Gold will maintain records of the waste monitoring program and the results using forms suitable for the TL Project. Data will be entered in a standardized format and program. Monitoring data for the TL will be collected during the construction phase; little to no waste will be generated during the operations phase of the TL. The small quantity of waste material generated during operations from periodic maintenance and repair activities will be collected and tracked under the Waste Management Plan (November 2021) developed for the Mine Site Major Works.

Waste monitoring results and management activities will be reported in the Annual Reclamation Report submitted to the EMLI. Results and monitoring activities will be reported until further monitoring of and management is not required, as determined by the BW Gold EM.

Environmental incidents and non-compliance related to the TL IDWMP will be reported by the Contractor Construction Manger to the BW Gold EM. All incidents and related actions will be recorded by the BW Gold EM and maintained in an incident database.

9.2 Record Keeping

A database will be created by the BW Gold EM to record survey and monitoring results as well as the location, dates, techniques and extent of the management techniques employed. Data will be entered in a format and program that will allow for comparison between years. Monitoring data will be stored for the life of TL and mine.

10.0 Evaluation and Adaptive Management

The Plan is a living document that will evolve over time in response to monitoring results and regulatory changes. The plan incorporates adaptive management as follows:

- **Plan**
  - Identification of potential and actual waste discharges.
  - Identification of waste management strategies.
- **Do**
  - Schedule for implementation and operation of control measures.
  - Description of record keeping procedures for tracking all wastes (recycled or otherwise disposed) taken off site.
  - Provide proper containers for segregation of wastes to prevent or minimize wildlife attractants and encounters.
  - Training procedures.
- **Monitor**
  - Execution of monitoring programs to ensure appropriate waste levels are not exceeded.
  - Inspection of waste management areas and facilities.
  - Implementation of the Plan.

- **Adjust**
  - Reviews made of effectiveness of management measures done by the EM.
  - Updates made to the Plan as required.

The TL IDWMP will be reviewed midway through the TL construction by the BW Gold EM or delegated QP until monitoring confirms that waste management is no longer required. Metrics include:

- Non-compliance with this plan; and
- Non-compliance with applicable conditions in permits or authorizations.

If these metrics are not met, the Contractor Construction Manager and BW Gold EM will consider adapting or implementing new mitigation measures. If long-term monitoring identifies new information that could improve waste management practices, then adaptive management actions will be implemented.

10.1 Continuous Improvement

Results from waste monitoring will be reviewed to determine if there are changes to ecosystem functions, loss of biodiversity, and increased erosion and sedimentation. In the event that the TL Project is impacting soils, vegetation or ecosystems, corrective actions will be considered.

Monitoring data will also be used to modify management and monitoring procedures.

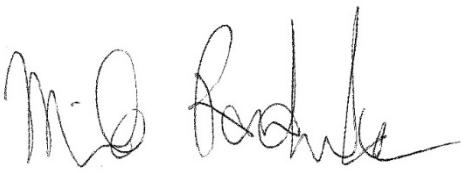
11.0 Plan Revision

The TL IDWMP is a ‘living document’ and any plan revisions will be made in accordance with the plan this is appended to (Condition 13 – Construction Environmental Management Plan).

12.0 Qualified Professionals

This management plan has been prepared and reviewed by, or under the direct supervision of, the following QPs:

Prepared by:



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Project Manager
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Reviewed by:

David J. Watt
Registered Professional Forester
Strategic Natural Resource Consultants Inc. h

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Appendix N Transmission Line Fuel Management and Spill Control Management Plan

ARTEMIS GOLD INC | Blackwater Mine

Transmission Line Fuel Management and Spill Control Plan

Table of Contents

List of Tables

Work Instructions

Transmission Line Fuel Management and Spill Control Plan

Version	H.1
Replaces	G.1
Creation Date	09/04/2023
Scheduled Review Date	
Review Date	
Document Team Members	
Document Owner:	
Document Approver:	
Related Documents:	
Key Contacts:	
Change Requests:	

Acronyms and Abbreviations

BC	British Columbia
BMP	Best Management Practices
BW Gold	BW Gold Ltd.
CCME	Canadian Council of Ministers of the Environment
CEO	Chief Executive Officer
CM	Construction Manager
COO	Chief Operating Officer
CSFN	Carrier Sekani First Nations
DFO	Fisheries and Oceans Canada
DS	Decision Statement
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
ECCC	Environment and Climate Change Canada
EM	Environmental Manager
EMBC	Emergency Management British Columbia
ELoMC	Environmental Life of Mine Monitoring Committee
EMLI	Ministry of Energy, Mines and Low Carbon Innovation
EMS	Environmental Management System
ENV	Ministry of Environment and Climate Change Strategy
EPC	Engineering, Procurement, and Construction
FOR	Ministry of Forests
FRPA	*Forest and Range Practices Act*
FSR	Forest Service Road
GM	General Manager
ha	Hectare
HWR	Hazardous Waste Regulation
Indigenous nations	Ulkatcho First Nation, Lhoosk'uz Dené Nation, Nadleh Whut'en First Nation, Stellat'en First Nation, Saik'uz First Nation, and Nazko First Nation (as defined in the Project's Environmental Assessment Certificate #M19-01)
km	Kilometre
LDN	Lhoosk'uz Dené Nation
LOO	Licence of Occupation

m	Metre
MERP	Mine Emergency Response Plan
MOE	Ministry of Environment
NFN	Nazko First Nation
NWFN	Nadleh Whut'en First Nation
OHS	Occupational Health and Safety
the Project	Blackwater Gold Project
QP	Qualified Professional
RoW	Right-of-Way
SDS	Safety Data Sheets
SFN	Saik'uz First Nation
SOP	Standard Operating Procedure
TDG Act	*Transportation of Dangerous Goods Act*
TDGR	Transportation of Dangerous Goods Regulation
TL	Transmission Line
TL FMSCP	Transmission Line Fuel Management and Spill Control Plan
TL IPD	Transmission Line Initial Project Description
UFN	Ulkatcho First Nation
VP	Vice President
WHMIS	Workplace Hazardous Materials Information System

1.0 Project Overview

The Blackwater Gold Project (the Project) is a gold and silver open pit mine located in central British Columbia (BC), approximately 112 kilometres (km) southwest of Vanderhoof, 160 km southwest of Prince George, and 446 km northeast of Vancouver. The Project site is presently accessed via the Kluskus Forest Service Road (FSR), the Kluskus-Ootsa FSR and an exploration access road, which connects to the Kluskus-Ootsa FSR at km 142. Electrical power for the Project will be supplied by a new approximately 135 km and up to 140 m wide corridor, 230 kilovolt overland transmission line (TL) that will connect to the BC Hydro grid at the Glenannan substation located near the Endako mine, 65 km west of Vanderhoof. A brief description of the proposed TL is as follows:

- From the Glenannan substation to the mine site permit area, the TL will be permitted by way of Licence of Occupation (LOO);
- The TL will be constructed within a cleared right-of-way (RoW) of 40 metre (m) width for standard spans, but up to 50 m width for longer spans in select areas. The TL RoW area is approximately 541 ha for the entire length of 135 km;
- Existing permitted and non-status roads will be used for the purpose of accessing the RoW. New access trails and stream crossings will be located only within the TL cleared RoW;
- Equipment and material laydown areas will also lie within the cleared RoW; and
- The construction workforce will be housed at the Project camp or other independent commercial accommodations in the area.

Overall Project construction is anticipated to take two years. The TL is anticipated to take approximately 14 months to construct. Post-construction, most of the temporary access trails used for construction on the TL RoW will be deactivated and/or decommissioned within 3 years except for of those required for maintenance. During operation of the TL there will be periodic inspections and maintenance as well as occasional unscheduled power supply interruptions that will require inspection and maintenance/repair activities.

Once commissioned, the TL will be required to support mine development through operations and mine closure.

The mine site is located within the traditional territories of Lhoosk'uz Dené Nation (LDN), Ulkatcho First Nation (UFN), Skin Tyee Nation and Tsilhqot'in Nation. The Kluskus and Kluskus-Ootsa Forest Service Roads (FSRs) and Project TL crosses the Traditional Territories of Nadleh Whut'en First Nation (NWFN), Saik'uz First Nation (SFN), and Stellat'en First Nation (StFN; collectively, the Carrier Sekani First Nations) as well as the Traditional Territories of the Nazko First Nation (NFN), Nee Tahi Buhn Band, Cheslatta Carrier Nation, and Yekooche First Nation (EAO 2019a and 2019b).

Additional details on transmission line components and activities are presented in Section 3.2 of the Transmission Line Initial Project Description (TL IPD; BW Gold 2022a).

2.0 Purpose and Objectives

The Transmission Line Fuel Management and Spill Control Plan (TL FMSCP) identifies procedures to transport, transfer, dispense, store, and manage petroleum products during the TL construction and operations phases for the Project. The TL FMSCP includes a Spill Response Plan and a contingency plan for preventing, managing, and containing spills on the transmission line construction site, and along product transportation routes.

The objectives of the Transmission Line FMSCP are to:

- Describe plans for fuel delivery and storage, and fuel handling and dispensing, transport, and inspections.
- Provide practices and procedures for timely and coordinated response to an environmental emergency in case of a fuel spill, and scheduled reviews of such practices and procedures.
- Train personnel to understand the type and extent of an environmental emergency and fuel spill situation and to respond efficiently.
- Describe communication protocols to notify authorities, stakeholders, Indigenous nation, and communities in the event of an environmental emergency, so that those groups may initiate timely response for their own interests or so that their assistance may be elicited.
- Describe response procedures for early containment and control of an environmental emergency, and approaches to cleanup so that any consequences of an environmental emergency are managed responsibly.

The TL FMSCP is linked to the Transmission Line Construction Environmental Management Plan, Emergency Response Plan, and Transmission Line Industrial and Waste Management Plan.

A number of provincial permits and authorizations will be required to construct and operate the TL. The primary permits include the following: Statutory RoW and interim LOO for Crown Land, an Occupant Licence to Cut, Road and Road Use Permits, and Junction Permits for critical road intersections.

The Transmission Line Fuel Management and Spill Control Plan (TL FMSCP) support applications for Crown land tenure (i.e., Statutory RoW, LOO) under the *Land Act* and is also required under the *Forest and Range Practices Act* (FRPA), and the Occupational Health and Safety (OHS) Regulation. The TL FMSCP has been developed based largely on the fuel management and spill control requirements under section 9.14 of the Joint Application Information Requirements for *Mines Act* / *Environmental Management Act* Permits (Ministry of Energy, Mines and Petroleum Resources & Ministry of Environment and Climate Change Strategy 2019). The TL FMSCP takes into consideration the comments received from Indigenous nations during the preparation of the FMSCP submitted as part of the JAIR Application for BW Gold's Major Works (BW Gold 2022b).

3.0 Roles and Responsibilities

BW Gold has the obligation of ensuring that all commitments are met and that all relevant obligations are made known to mine personnel and site contractors during all phases of the mine life. A clear understanding of the roles, responsibilities, and level of authority that employees and contractors have when working at the mine site is essential to meet Environmental Management System (EMS) objectives.

Table 3-1 provides an overview of general environmental management responsibilities during all phases of the mine life for key positions that will be involved in environmental management. Other positions not specifically listed in Table 3-1 that will provide supporting roles include independent Environmental Monitors, and other qualified persons and Qualified Professionals (QPs).

Table 3-1: Blackwater Roles and Responsibilities

Position	Responsibility
Chief Executive Officer (CEO)	The CEO is responsible for overall Project governance. Reports to the Board.
Chief Operating Officer (COO)	The COO is responsible for engineering and Project development and coordinates with the Mine Manager to ensure overall Project objectives are being managed. Reports to the CEO.
Vice President (VP) Environment & Social Responsibility	The VP is responsible for championing the Environmental Policy Statement and Environmental Management System (EMS), establishing environmental performance targets, and overseeing permitting. Reports to the COO.
General Manager (GM) – Development	The GM is responsible for managing Project permitting, the Project's administration services and external entities, and delivering systems and programs that ensure Artemis's values are embraced and supported: Putting People First, Outstanding Corporate Citizenship, High Performance Culture, Rigorous Project Management and Financial Discipline. Reports to the COO.
Mine Manager	The Mine Manager, as defined in the *Mines Act*, has overall responsibility for mine operations, including the health and safety of workers and the public, EMS implementation, overall environmental performance and protection, and permit compliance. The Mine Manager may delegate their responsibilities to qualified personnel. Reports to the GM.
Construction Manager (CM)	The CM is accountable for ensuring environmental and regulatory commitments/ and obligations are being met during the construction phase. Reports to the GM.
Environmental Manager (EM)	The EM is responsible for the day-to-day management of the Project's environmental programs and compliance with environmental permits, updating EMS and management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and Engineering, Procurement, and Construction contractor, other contractors, the Company, and regulatory agencies, where required. Supports the CM and reports to the Mine Manager.
Departmental Managers	Departmental Managers are responsible for implementation of the EMS relevant to their areas. Report to the Mine Manager.
Indigenous Relations Manager	Indigenous Relations Manager is responsible for Indigenous engagement throughout the life of mine. Also responsible for day-to-day management and communications with Indigenous nations. Reports to the EM.
Community Relations Advisor	Community Relations Advisor is responsible for managing the Community Liaison Committee and Community Feedback Mechanism. Reports to the Mine Manager.
Environmental Monitors	Environmental Monitors (includes Environmental Coordinators and Technicians) are responsible for tracking and reporting on environmental permit obligations through field-based monitoring programs. Report to the EM.

Position	Responsibility
Aboriginal Group Monitors	Aboriginal Group Monitors are required by EAC #M19-01 Condition 17 and will be responsible for monitoring the Project's potential effects on Indigenous interests. Aboriginal Group Monitors will be involved in adaptive management and follow-up monitoring programs. Report to the EM.
Employees and Contractors	Employees and contractors are trained and are responsible for being aware of permit requirements specific to their roles and responsibilities. Report to the Departmental Managers.
Qualified Professionals and Qualified Persons	Qualified professionals and qualified persons will be retained to review objectives and conduct various aspects of environmental and social monitoring as specified in Environmental and Social Management Plans.
Chief Executive Officer (CEO)	The CEO is responsible for overall Project governance. Reports to the Board.

BW Gold will employ a qualified person as Environmental Manager (EM) who will ensure that throughout the TL construction phase, the EMS requirements are established, implemented, and maintained, and that environmental performance is reported to management for review and action. The EM is responsible for retaining the services of qualified persons or QPs with specific scientific or engineering expertise to provide direction and management advice in their areas of specialization. The EM will be supported by a staff of Environmental Monitors that will include Environmental Specialists and Technicians and a consulting team of subject matter experts in the fields of environmental science and engineering.

During the TL construction, BW Gold will be entering into an EPC contract for the Transmission Line. The engineer/contractor will have their own CM and there will be a BW Gold responsible PM and/or Superintendent who ultimately reports to the GM Development. The EPC contractor will report to the CMs who will ultimately be responsible for ensuring that impacts are minimized, and environmental obligations are met during the Construction phase. BW Gold will maintain overall responsibility for management of the construction and operation of the TL and will therefore be responsible for establishing employment and contract agreements, communicating environmental requirements, and conducting periodic reviews of performance against stated requirements.

The CM is accountable for ensuring that environmental and regulatory commitments/obligations are being met during the construction phase. The EM will be responsible for ensuring that construction activities are proceeding in accordance with the objectives of the EMS and associated management plans. The EM or designate will be responsible for reporting non-compliance to the CM, and EPC contractor, other contractors, the Company, and regulatory agencies, where required. The EM or designate will have the authority to stop any construction activity that is deemed to pose a risk to the environment and work will only proceed when the identified risk has been addressed and concerns rectified.

The TL EPC contractor roles and responsibilities relating to environmental management, industrial and domestic waste management, and environmental protection are identified below in Table 3-2.

Table 3-2: Transmission Line Construction Contractor Roles and Responsibilities

Role	Responsibility
Contractor Construction Manager (CCM)	The CCM has ultimate responsibility for construction proceedings, including worker and public health and safety and environmental protection. The CCM will ensure the implementation of training programs as well as support the Blackwater Gold Environmental Policy. The CCM will ensure that adequate support and resources are made available for the implementation and maintenance of the Environmental Management System, including the management plan implementation and review. The CCM may, as needed, delegate their duties to Qualified Professional. Report to the BW Gold Construction Manager.
Contractor Construction Superintendents	The Contractor Construction Superintendents have an administrative responsibility and requirement to act upon the directions, guidance, and support of the Construction Manager. They are resources to the CCM, and have the following responsibilities: • Support the implementation of the Blackwater Gold Environmental Policy; • Ensure that environmental matters are given consideration in pre-planning of construction activities, budgets, training, and operations; and • Ensure that workers under their supervision are made aware of known, or reasonably foreseeable, environmental aspects where they work.
Construction Employees, Contractors, and Sub-Contractors	Employees have general responsibilities for environmental protection, which include: • Supporting the Blackwater Gold Environmental Policy; • Supporting implementation of Environmental Management Plans; • Cooperating with the Blackwater Environmental Monitoring Committee representative(s); • Learning and following environmental best practices and procedures relevant to their work; • Following instructions and directives given by supervisors; • Operating equipment in an environmentally responsible manner to avoid environmental impacts; • If training another worker, ensuring that they are properly completing all required tasks and responsibilities in accordance with environmental best practices procedures; • Reporting all environmental incidents immediately to their supervisor, who will expedite a response to address the incident; • Participating in mitigating or minimizing harm to the environment should an environmental incident occur; and • Asking for help or information when unsure how to perform a task without compromising social, cultural, archaeological, or environmental values.

Environmental management during operation of the Project will be integrated under the direction of the EM, who will liaise closely with Departmental Managers and will report directly to the Mine Manager. The EM will be supported by the VP of Environment and Social Responsibility in order to provide an effective and integrated approach to environmental management and ensure adherence to corporate environmental standards. The EM will be accountable for implementing the approved management plans and reviewing them periodically for effectiveness. Departmental area managers will be directly responsible for implementation of the EMS and management plans and standard operating procedures relevant to their areas. All employees and contractors are responsible for daily implementation of the practices and policies contained in the EMS.

During closure and post-closure staffing levels will be reduced to align with the level of activity associated with these phases. Prior to initiating closure activities, BW Gold will revisit environmental and health and safety roles and responsibilities to ensure the site is adequately resourced to meet permit monitoring and reporting requirements. The Mine Manager will maintain overall responsibility for Closure and Post-closure activities.

Pursuant to Condition 19 of the EAC #M19-01, BW Gold has established an Environmental Life of Mine Monitoring Committee (EloMC) to facilitate information sharing and provide advice on the development and operation of the Project, and the implementation of EAC conditions, in a coordinated and collaborative manner. Committee members include representatives of the Environmental Assessment Office (EAO), UFN, LDN, NWFN, StFN, SFN, NFN, Ministry of Energy, Mines and Low Carbon Innovation (EMLI), Ministry of Environment and Climate Change Strategy (ENV) and Ministry of Forests (FOR).

Pursuant to Condition 17 of the EAC #M19-01, Aboriginal Group Monitor and Monitoring Plan, BW Gold will retain or provide funding to retain a monitor for each Indigenous nation defined in the EAC #M19-01 prior to commencing construction of the TL and during the TL's active maintenance activities and decommissioning. The general scope of the monitor's activities will be related to monitoring for potential effects from the TL on the Indigenous nations' interests.

4.0 Compliance Obligations, Guidance, and Best Management Practices

4.1 Legislation

Federal legislation applicable to the TL FMSCP includes:

- *Canadian Environmental Protection Act, 1999;*
  - Environmental Emergency Regulations;
  - Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations;
  - Interprovincial Movement of Hazardous Waste Regulations;
- *United Nations Declaration on the Rights of Indigenous Peoples Act:*
- *Hazardous Products Act:*
  - Hazardous Products Regulations:
- *Hazardous Materials Information Review Act;*
  - Hazardous Materials Information Review Regulations

- *Transportation of Dangerous Goods Act, 1992;*
  - Transportation of Dangerous Goods Regulations (TDG Regulations);
- *Fisheries Act.*

Provincial legislation applicable to the TL FMSCP includes:

- BC Building Code Regulations;
- BC Fire Code Regulations;
- *Environmental Assessment Act;*
- *Mines Act;*
  - Health, Safety and Reclamation Code for Mines in British Columbia (EMLI 2021).
- *Environmental Management Act;*
  - Contaminated Sites Regulation;
  - Hazardous Waste Regulation;
  - Ozone Depleting Substances and Other Hydrocarbons Regulation;
  - Petroleum Storage and Distribution Facilities Storm Water Regulation;
  - Spill Contingency Planning Regulation;
  - Spill Preparedness, Response and Recovery Regulation;
  - Spill Reporting Regulation;
  - Waste Discharge Regulation;
- *Fire Services Act;*
  - British Columbia Fire Code Regulation;
- *Land Act;*
- *Forest and Range Practices Act* (FRPA); and
- Workplace Hazardous Materials Information System (WHMIS) Regulation (Mines).

4.2 Environmental Assessment Certificate and Federal Decision Statement

The Project received an EAC #M19-01 on June 21, 2019, under the 2002 *Environmental Assessment Act*, and received a Decision Statement (DS) on April 15, 2019, under the *Canadian Environmental Assessment Act*, 2012, approving the Project with conditions. The EAC and DS includes activities associated with the construction and operation of an electrical TL that is required to provide the energy requirements for the Project.

There are no EAC #M19-01 or federal DS conditions specific to the TL FMSCP.

4.3 Existing Permits

BW Gold received *Mines Act* Permit M-246 on June 22, 2021, authorizing early construction works (Early Works) within a permitted area encompassing 1,018.9 hectares (ha) at the mine site. *Environmental Management Act* Authorization 110662 authorizes discharges associated with the Early Works and Special Use Permit SP0001 authorizes construction of the Mine Access Road. The Occupant Licence to Cut accompanying *Mines Act* Permit M-246 did not include authorization to cut the TL corridor within the mine site. BW Gold received an amended *Mines Act* Permit M-246 on March 8, 2023, approving the Mine Plan and Reclamation Program and superseding the previous version. On May 2, 2023, BW Gold received *Environmental Management Act* Permits PE-110650 authorizing discharge of air contaminants to the atmosphere and PE 110652 authorizing discharge of effluent to surface water and groundwater from the Blackwater mine.

BW Gold received *the License of Occupation* for the transmission line on April 24, 2023, authorizing construction works on the Transmission Line. The Occupant Licenses to Cut that accompanied License of Occupation 7409823 were issued on April 24, 2023, and authorized clearing of the TL corridor between the Glenannon Substation and the boundary of the Mines Act Permit.

4.4 Guidance and Best Management Practices

Guidance documents related to fuel management and spill prevention include:

- A Guide to Fuel Handling, Transportation & Storage. BC Ministry of Water, Land and Air Protection (BC MWLAP, 2002);
- Implementation Guidelines for Part 8 of the *Canadian Environmental Protection Act, 1999* – Environmental Emergency Plans (Government of Canada, 2004);
- Canadian Standards Association. Emergency Preparedness and Response (CSA-Z731-03 (R2014).
- Chief Inspector’s Directive – Hydrocarbon Spills, May 15, 2015; (EMLI 2015);
- Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products (CCME 2003); and
- Technical Guidelines for the Environmental Emergency Regulations, 2019 Version 2.0 (ECCC 2019).

5.0 Support

5.1 Training and Awareness

Employees and contractors will receive training in spill response procedures on their arrival on site and prior to the start of work as part of the Site Orientation as well as refresher training. The purpose of this training is to provide all site personnel with a basic level of environmental awareness and an understanding of their obligations regarding compliance with regulatory requirements, commitments, and best practices. The EM will work with the EPC contractor in developing the environmental content for the Site Orientation and refresher training. Records will be maintained in database and designated employees will be responsible for delivering the Site Orientation.

All those responsible for the management, implementation, and operation of any aspect of this plan will be competent for their role. Prior to the commencement of work on the Project, these personnel will:

- Have reviewed and be aware of the requirements of this plan.
- Be aware of the legislative requirements, specifically including but not limited to:
  - Workplace Hazardous Materials Information System;
  - Material Safety Data Sheets (SDS);
  - Hazardous Waste Regulation;
  - Spill Reporting Regulation;
  - A Guide to Fuel Handling, Transportation & Storage (BC Ministry of Water, Land and Air Protection); and
  - Transportation of dangerous goods (federal and provincial legislation and regulations).
- Be trained in and aware of:
  - Safety and emergency response procedures;
  - Simulations of different spill scenarios, response procedure training, and post-simulation evaluation;
  - Evacuation procedures;
  - Procedures for handling fuels and controlling and cleaning-up leaks and spills;
  - Speed limits on roads on and off the mine site;
  - Obligations to report all spills; and all communication protocols with Indigenous nations;
  - Role of Aboriginal Group Monitors related to spill response; and
  - Be knowledgeable in fuel storage and handling locations and spill response equipment locations on mine site.
- Be trained in spill response procedures.

5.2 Internal and External Communication

5.2.1 Internal Communication

Spills greater than 10 litres and spills of dangerous goods greater than1 litre will be reported to the EM. Environmental incident reports are submitted to the EM and Mine Manager, and copies forwarded to the Health and Safety Manager. External Communication

The BW Gold Environmental Manager is responsible for communicating with EMBC after the initial report and notifying the Ministry of Environment (MOE) depending on the environmental impact and whether a spill threshold was exceeded. To do this accurately, an internal Spill Report Procedure and Spill Report Form must be used.

5.2.2 External Communication

Spill regulatory thresholds are identified in Appendix A and will be reported to Emergency Management BC (EMBC) by the Mine Manager or designate. The EM will notify the ENV depending on the environmental impact and whether a spill threshold was exceeded (e.g., spill below a reporting threshold, but it has or is likely to enter a body of water). External contacts are listed in Table 5.2-1.

Table 5.2-1: External Contact Information

Contact	Phone Number	Contact	Phone Number
Mine Manager (or delegate)	Tim Donnelly 604-558-1107	Emergency Management BC	1 800 663 3456
Environmental Department	Sarah Harrison 250-818-3765	Poison Control	911
Environmental Monitor	TBD	Spills - BC Environment	1 800 663 3456
Chief Inspector of Mines	250-952-0494	Deputy Chief Inspector of Mines	250-952-0471
BC Wildfire: • Phone • Cell	 250 565 6124 *5555	WorkSafe BC: • General • After Hours	 1 888 621 7233 1 866 922 4357
Conservation Office – Vanderhoof	250 567 6304	Department of Fisheries and Oceans (Prince George)	250-627-3499
BC Hydro	1 800 224 9376	Transportation Safety Board of Canada	1-800-387-9557
RCMP – Vanderhoof	250-567-2222	RCMP – Fort St. James	250-996-8269
RCMP- Prince George	250-561-3300		
BC Air Ambulance Service	911	BC Ambulance Service – Vanderhoof	250-567-9039
St Johns Hospital Vanderhoof	250-567-2211	University Hospital of Northern British Columbia	250-565-2000
Northern Thunderbird Air (NT Air)	250-963-9611	Yellowhead Helicopters – Vanderhoof	250 567-5777

Office	Phone	Email
Ulkatcho First Nation Office Chief Lynda Price ELoMC Representative – Vanesa Gottfriedson	250-742-3260	chief@ulkatcho.ca Vanessagottfriedson@ulkatcho.ca
Lhoosk'uz Dené Nation Chief Liliane Squinas Councilor June Baptiste ELoMC Representative Laurie Vaughn – Band Administrator Jeana Moore – Director	250-992-3290	lsquinas@lhooskuz.com Tsunie@lhooskuz.com Bandadministrator@lhooskuz.comNeba_nduwhulh'ih@lhooskuz.com

Office	Phone	Email
Nadleh Whut'en First Nation Chief Marten Louie ELoMC Representative – Kirsten Chapman Rose DaSilva	250-690-7211, ext. 113	chunih@nadleh.ca
Stellat'en First Nation Chief Robert Michell ELoMC Representative – Doug Casimel/Isaiah Reynolds	250-699-8747, ext. 31	Chief@stellaten.ca
Saik'uz First Nation Chief Priscilla Mueller ELoMC Representative – Kasandra Turbide	250-567-9293, ext. 220	priscilla.mueller@saikuz.com
Nazko First Nation Chief Leah Stump ELoMC Representative - Stephanie Deneault and Florian Bergoin	250-992-9085	leahstump@nazkoband.ca
Skin Tyee Nation Chief Rosemarie Skin	250-694-3517	chief@stfn.ca
Tŝilhqot'in Nation Chief Joe Alphonse	250-392-3918	TBC
Métis Nation British Columbia Collete Trudeau (Chief Executive Officer)	604-557-5851	ctrudeau@mnbc.ca
Nee-Tahi-Buhn Band Chief Marcella Morris	250-694-3494	Marcella.morris@ntbb.ca

Notes:

BC = British Columbia; BC EMLI = British Columbia Ministry of Energy, Mines and Low Carbon Innovation; BC ENV = British Columbia Ministry of Environment and Climate Change Strategy; EMBC = Emergency Management BC; RCMP = Royal Canadian Mounted Police

This table will be updated to include emergency contacts for communities, Indigenous nations, individual residents, and other industries identified in the Project area as having the potential to incur effect from an emergency incident occurring at the mine site. This table will also be updated to include any other contacts (designated mine site control centre, specialist consultants, etc.) identified. All information in this table is periodically updated as needed to remain current.

6.0 Fuel Management, Storage, Transportation, and Inspection

Diesel and gasoline will be used at the transmission line construction sites. Diesel will be used to power machinery and mobile equipment, and gasoline will be used to power some machinery and mobile equipment.

In case of a fuel spill, the Spill Response Plan will be followed (Section 7). The following management practices will be implemented throughout all phases of the Project to prevent spills and other hazards that may result from managing, storing, or transporting fuel.

6.1 General

- All operators will remain with the fuel nozzle while refueling. Automatic shut-off nozzles must be used when dispensing fuel *(an automatic shut-off nozzle is any spring-loaded nozzle that closes when manual pressure is released).*
- Hoses will be equipped with a break-away valve.
- Fuel delivery drivers will be trained on the Spill Response Plan and spill reporting requirements both within and outside the transmission line project boundary.
- Obey all posted speeds within and outside the transmission line project boundary
- All spills or accidents will be reported immediately.
- Ignition will be turned off while the vehicle or equipment is being refueled.
- Two approved and current 10-lb BC fire extinguishers must be available within nine (9) metres of the work area while handling fuel.
- Fuel loading procedures must be posted at the fueling site and reviewed with all personnel.
- After refueling, hose and nozzle and will be stored in a secure and safe position to prevent unnecessary spillage. Hoses will be kept off the ground and valves closed and locked when not in use.
- Do not fuel or service equipment (that can be moved) within a riparian management area of a stream or wetland, or within 30 metres of a shoreline or high-water mark of a water body.
- When fueling stationary equipment within the Riparian Management Area of a stream or Wet land CSA approved fuel containers that are less than 25 litres in capacity will be utilized. Fueling will be completed within an area of secondary containment.
- Fuel Containers that will be utilized for fueling stationary equipment will be stored outside of the Riparian Management Area.
- All transfers from tanker trucks to tanks at remote fueling stations will be conducted utilizing enclosed lines, hoses, and pumps.
- All storage and transfer locations will be equipped with appropriate spill kits.
- Fuel dispensers will be designed to meet the statutory regulations and recommended practices described in A Field Guide to Fuel Handling, Transportation, and Storage (BC Ministry of Water, Land, and Air Protection 2002) and the BC Fire Code.
- Fixed fuel dispensers will be physically protected from collision damage by concrete barriers (> 10 cm high) or large rock boulders.
- Overflow protection must be installed for all tanks where loading and dispensing operations occur.
- Complete daily visual inspections of the piping system, pumps and ancillary equipment for leaks spills and obvious abnormal conditions.
- Fuel transfer procedures will include best management steps to ensure no overtopping of tanks or spillage.
- Fuel tanks will be CSA approved and comply with regulations and recommended practices described in A Field Guide to Fuel Handling, Transportation, and Storage (BC Ministry of Water, Land, and Air Protection 2002) and the BC Fire Code. Tanks over 450 litres will bear a current Underwriters Laboratories of Canada (ULC) certification plate or label (BC Ministry of Water, Land, and Air Protection 2002).

- The Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products (Canadian Council of the Ministers of the Environment 2003) states that all aboveground storage tank systems containing petroleum products and having a single or total capacity of more than 4,000 litres (880 gallons) at a site shall be registered with the authority having jurisdiction.
- To minimize the risk of fuel leaks during storage of fuel:
  - All equipment used to store or dispense fuel will be sound and free of any damage or defects.
  - Fuel storage locations and equipment will be inspected according to a developed inspection program. Fuel storage locations will be visually inspected daily for leaks, spills, and obvious abnormal conditions. Any leakage will be reported to a supervisor and repaired immediately
  - All tanks will be regularly serviced.
  - Tanks will be filled to an acceptable safe filling level of approximately 90% capacity (BC Ministry of Water, Land, and Air Protection 2002).
- All fuel storage vessels will include a secondary containment.
- Fuels will be stored separately from corrosive materials.
- Smoking in and around fuel storage and fuel dispensing facilities will be prohibited. Signage will be placed adjacent to all such locations.
- Fuel storage and dispensing will occur at least 30 m from watercourses and wetlands.
- Fuel will be transported in containers and vehicles that comply with the federal Transportation of Dangerous Goods Act and the provincial Transport of Dangerous Goods Act hazard classification.
- Vehicles and containers for the transportation of fuel will be labelled to communicate the hazard the material represents, made of a material that is compatible with the transported fuel, and in good condition (not damaged, rusting, or leaking).
- Tanks and containers with a capacity of greater than 50 gallons (230 litres) used for the transportation of flammable liquids or combustible liquids, shall conform to the requirements for the construction of cargo tanks on tank vehicles.
- Fuels will be transported separately from other hazardous or non-compatible materials.
- Minimize the risks from a fuel spill during transport.
- Vehicles and transportation plans will be designed to minimize the chance of a potential spill and to minimize the effect of a spill, should one occur.
- Transport containers will be properly secured and positioned to allow safe access and handling of containers.
- Containers of 5 gallons (23 litres) or less should be stored in an equipment box (Truck box/slip, Tidy Tanks) of a vehicle, reducing the risk of the container to bounce and spill.
- Slip tanks will be regularly inspected for leaks and cracks. The slip tank will be repaired or replaced as required to maintain tank integrity.
- The spill response plan and a spill response kit, capable of containing and absorbing fuel spills will be available in all vehicles that are used for the transportation of fuel.
- Maintain appropriate spill equipment with the transport vehicle and at all work sites.

6.2 Storage and Dispensing Standards for Small Fuel Containers and Drums (less than 230 litres)

- Fuel containers greater than 30 litres must be ULC or CSA approved.
- Fuel containers less than 30 litres must conform to WHMIS and Fire Code Standards.
- Jerry cans and small containers must meet the new TP14850 standard (ensure that the specifications and date of manufacture are known and that the containers are not used 60 months past this date).
- Fuel containers > 30 litres and < 230 litres:
  - Must be specifically designed for the product being contained;
  - Must be filled and capped so that under normal conditions there will be no leakage that would endanger public safety and the environment; and
  - Must not be filled beyond their safe filling level (90%).
- Store and dispense small fuel containers and drums:
  - Outside of any Riparian Management Area to avoid spillage into any body of water;
  - In a location that is of low risk for collisions.
- Drums must be properly sealed and capped to prevent loss of the product. Drums must be free from rust, severe dents, and leaks.
- Hoses and nozzles must be in good repair and must not leak.
- WHMIS labels or appropriate product identification must be attached and be legible.
- Must maintain current Material Safety Data Sheet (SDS) for the product being stored in a location that is available to workers.
- Smoking is not permitted during dispensing operations. “No smoking signs” must be in place when dispensing fuel.
- No gravity feed systems are permitted for dispensing fuel.
- Must use dispensing pumps designed for the products being handled (e.g., water pumps for dispensing fuel are not allowed), and must use hoses and nozzles designed and suitable to dispense fuel.
- Operators must stay with the nozzle at all times while dispensing fuel.
- Nozzles must be secured within drip containment or in an upright position when not in use. Must store the nozzle above the pump to avoid siphoning.
- Drum inventory should be rotated and replaced, as necessary. Must return empty containers to suppliers or recycling facilities.
- Store partial drums of fuel on their sides with the filler opening above the level of the liquid.
- Maintain one 5 lbs BC-rated fire extinguisher, or larger, when dispensing fuel.
- When fire extinguishers require servicing, a licensed facility must inspect, service, and tag all fire extinguishers.
- Maintain a spill kit of suitable size to contain fuel spills. See Section 9.
- Report spills as per spill reporting in Section 8 and Section 10.
- Recover spilled product by either removing contaminated soil, or by treating the soil on site. See Section 8.

6.3 Transporting Standards for Small Fuel Containers & Drums (less than 230 litres)

- If the combined capacity for multiple containers or drums carried on a vehicle exceeds 2,000 litres, it is strongly recommended that a qualified commercial carrier be used. The following TDG regulations will apply:
  - A shipping document must be completed for the goods hauled and it must indicate the last contained residue;
  - The operator must have TDG training, and they must possess a TDG Certificate; and
  - The load must be placarded with TDG Placards.
- Containers and drums must be secured in a manner to prevent shifting, swaying, damage, or escape from the vehicle using tie down straps that have a combined working load limit rating greater than the load being secured in accordance with Motor Vehicle Act and Regulation standards (working load limits are marked on the synthetic web tie down by the manufacturer).
- When being transported, Drums must be:
  - Stacked on their ends;
  - Separated by dunnage; and
  - Protected by sides, sideboards, or stakes on the vehicle.
- For containers stored within an enclosed unit (e.g., a shop van):
  - Labels must be visible from the outside of the unit; and
  - Maintain one 20 lbs BC or two 10 lbs BC fire extinguishers.

6.4 Storage, Dispensing, Transporting Standards for Truck Box (“Tidy”) Tanks Less than or equal to 450 litres – Diesel Only

Note: Tanks less than or equal to 450 litres in capacity containing Diesel are exempt from displaying a specification nameplate.

- Store and dispense fuel:
  - Outside of any Riparian Management Area to avoid spillage into any body of water; and
  - In a location that is of low risk for collisions.
- Tanks must be properly sealed and capped to prevent any loss of the product.
- Tanks must be free from any rust, severe dents, and leaks.
- Hoses and nozzles must be in good repair and not leak (in accordance with ULC standards). They must also use a pressure relief cap that meets manufacturers design specifications.
- A WHMIS label or appropriate product identification label is required to be attached to the tank. See example of a WHMIS label in Appendix B
- TDG labels (red and white diamond shaped, 2”-3” or larger) must be attached to the tank when transporting fuel. 1202 for diesel.
- Maintain current Safety Data Sheet (SDS) in a location available to workers.

- Tanks must be secured to the vehicle using a tie down mechanism that is rated at a level at or above the working load secured in accordance with Motor Vehicle Act and Regulation standards (working load limits are marked on the synthetic web tie by the manufacturer).
- Place a plywood or rubber mat under truck box tanks to prevent wear or damage to the tank.
- Smoking is not permitted during dispensing operations. “No Smoking” signs are recommended.
- No gravity feed systems are permitted for dispensing fuel.
- Use dispensing pumps designed for the products being handled (e.g., water pumps for dispensing fuel are not allowed).
- Always use hoses and nozzles that are designed and suitable to dispense diesel fuel. Fuel dispensing nozzles will be equipped with an Automatic shut-off and hoses will be equipped with a break-away valve.
- Automatic shut-off nozzles must be used when dispensing fuel (an automatic shut-off nozzle is any spring-loaded nozzle that closes when manual pressure is released).
- Operators must stay with the nozzle at all times while dispensing fuel.
- Nozzles must be secured within drip containment or in an upright position when not in use.
- Maintain one 10 lbs BC-rated fire extinguisher when dispensing fuel.
- When fire extinguishers require servicing, a licensed facility must inspect, service, and tag all fire extinguishers.
- Maintain a spill kit of suitable size to contain fuel spills. See Section 9.
- Report spills as per the spill reporting in Section 8 and Section 11.
- Recover spilled product by removing contaminated soil. See Section 8.
- Storage and Dispensing Standards for All Tanks Greater than 450 litres
- Risk assess the tank location using the Risk Assessment Table in Appendix C or using a similar process. Take appropriate spill risk mitigation measures.
- Stationary tanks and tanks on trailers must be mounted to a skid or securely mounted in a cradle on a fire-resistant foundation.
- Fuel truck tanks must be integrally mounted to the unit in accordance with the Motor Vehicle Act and Regulation standards.
- Close and lock valves when the tank will be left unattended for extended periods of time.
- Install break away valves in the dispensing hose unless the hose is retracted on a hose reel.
- Hoses will be equipped with a break-away valve.
- Ensure suitable bonding between tank and equipment to prevent static charges (only refers to gasoline).

6.5 Transporting Standards Tanks Greater than 450 litres Used to Transport Fuel

- Tanks moved containing >5% of the fuel tanks capacity still remaining, or 500 litres of fuel, must:
  - Have a specific nameplate attached (see TDG tank standards).

- Vehicles transporting TDG tanks on public roads must meet the Motor Vehicle Act Standards (i.e., GVW, brakes, lights, axles, etc.) and TDG requirements (placards and documentation).
- Tanks must be secured to the vehicle using a tie down mechanism that is rated at a level at or above the working load being secured in accordance with the Motor Vehicle Act and Regulation standards. (Working load limits are marked on the synthetic web tie down by the manufacturer).
- A TDG Label is required to be attached to the tank. The labels are red and white diamond shaped. **1202 for diesel.**
- The operator must have TDG training and possess a certificate if the combined capacity of all tanks being transported is greater than 2,000 litres.
- TDG Tanks with capacities exceeding 2,000 litres, the following conditions apply:
  - A shipping document must be completed for the goods hauled or the reside last contained in tanks;
  - The operator must have TDG training and possess a certificate; and
  - The load must be placarded on all four sides.

6.6 Storage and Dispensing Standards Large Stationary Tanks (generally greater than 3,000 litres) Used to Transport Fuel

- Must be designed, constructed, filled, closed, secured, and maintained so under normal conditions of handling and transport there will be no accidental release of dangerous goods that would endanger public or worker safety.
- Specification Tanks: used for diesel or gas and will generally have one of the following markings:
  - ULC-S601 Utility Tanks;
  - ULC-S653 AST Steel Tanks;
  - ULC-S602 AST Steel Tanks;
  - ULC-S630 AST Vertical Tanks;
  - CAN//ULC-S643-M;
  - ULC-C142.18 Rectangular Steel Tank; and
  - ULC-C142.17 Vertical Steel Tank.
- Non specification Tanks: All non-spec tanks must be taken out of operation. Any tank without a spec plate is non-spec. All tanks must be constructed and maintained to conform to a ULC specification for stationary above ground tanks.
- All stationary tanks must have secondary containment. Options include:
  - Tank-in-tank (vacuum monitored, visible access port or visible access hatch).
- All stationary tanks must use a pressure relief cap that meets manufacturers design specifications.
- Maintain visible safety marks:
  - Label or placard;
  - UN number; and
  - Shipping name.
- TDG Placards must be visible on all four sides.

- WHMIS labeling or appropriate Product Identification is required when storing hazardous products.
- Store nozzle & hose in a safe manner to prevent damage and leaks (i.e., on a retractor, hose reel or coiled)
- Do not place stationary skid tanks in riparian management areas or marine environments unless no other area is practicable.
- Large stationary skid tanks must be above ground, doubled wall with a positive containment monitoring leak protection feature, (vacuum gauge, visual port, or dipstick).
- As per manufacturer's recommendations, tanks must be appropriately secured to the skid and kept level to prevent shifting, swaying, damage escape and accidental release of product.
- Tanks must be mounted to a fire-resistant cradle and skid.
- Make sure there is suitable bonding to prevent static charges when dispensing gasoline.
- Maintain current SDS in a location available to workers.
- Hoses and nozzles must be maintained and not leak.
- Do not dispense fuel in riparian management areas or marine environments wherever practicable.
- Operators must always stay with the nozzle while dispensing fuel.
- Store nozzle & hose in a safe manner to prevent damage and leaks (i.e., on a retractor, hose reel, coiled or above the tank to prevent siphoning).
- Close valves when finished dispensing.
- Do not fill tanks beyond their safe filling level (approximate safe level – 90%).
- Keep fuel and equipment on level ground
- When moving a skid tank (with or without fuel) having a total capacity of diesel greater than 2,000 litres you must follow
  - TDG Regulations;
  - Complete a shipping document for the goods hauled or remaining in the tank; and
  - Maintain a valid TDG training certificate.
- All Skid-type tanks are considered stationary tanks (i.e., non-mobile tanks) and must be emptied (5% or less) prior to moving;

6.7 Inspections and Maintenance

Inspections

Storage and dispensing stations and mobile vehicles will be visually inspected daily. Inspections will be based on the type of tank and associated piping and include:

- Checking pipes, valves, flanges, connections and pumps for leaks, discolouration, or corrosion.
- Checking the secondary containment is dry and clean of residue.
- Checking the integrity of the liner and containment berm (fuel storage areas).
- Should they be part of the fuel system, testing all gauges, instrumentation, monitoring devices, alarms, leak detection, and low-pressure alarms and vacuum monitoring gauges to confirm they are working.

Inspections will be documented in a logbook and will meet the requirements of section 4.4 of the Fire Code.

Maintenance

Maintenance will include:

- Developing preventative maintenance strategies for transfer equipment, stationary equipment, and mobile equipment to prevent operational and leak causing failures.
- Using replacement parts that meet the manufacturer's specifications for the given application.
- Using catch trays to prevent oil spills during field repairs and immediately collecting any spilled oils.

7.0 Spill Prevention Strategies

The cause of any spill is generally attributable to either direct human error (fatigue, lack of training, etc.) or indirect human error (fire, explosion, equipment failure, etc.). Therefore, having appropriate prevention and contingency strategies are necessary to proper planning.

There are two categories of spill prevention, which are:

1. Prevention before the fact; and
2. Prevention after the fact.

Prevention before the fact is the anticipation of potential causes of spills and the implementation of preventative measures to ensure that these spills do not occur. Prevention after the fact is the determination of the cause of a spill and the implementation of measures to prevent its reoccurrence. Strategies that BW Gold employees will implement to prevent spills include:

- Awareness of spill response steps listed in Section 8 Spill Response Plan.
- Educating and training employees on the hazards and consequences of spills and on methods of transfer, transport, and storage. This may be achieved by conducting seminars, drills, and field practice.
- Following the correct fuel transfer, storage, filling, and disposal procedures.
- Taking care when working around watercourses.
- Making a checklist of the operation's potentially environmentally hazardous areas and operations available to the maintenance inspectors and operators. These checklists would be used for inspections and quality control.
- Using area logbooks to document regular inspections.
- Using anti-spill devices such as drip pans, interceptor drains, high-level sensors and one-way valves when transferring hydrocarbons and other liquids from one vessel to another.

7.1 Containment

Appropriate containment vessel selection, facility design, and dispensing protocol is a key component of spill risk reduction. The following containment-related design parameters or mitigation measures will be implemented to reduce the risk of fuel spills on the transmission line construction site:

- For leak control and environmental protection, all unenclosed stationary fuel storage tanks larger than 454 litres will be double walled.
- Fuel storage areas will be lined to ensure leaks and spillage are captured and contoured to allow containment and capture of stormwater.

- Where fuelling equipment cannot be situated inside the containment areas, drip trays will be provided to contain any spills that might occur.
- Containment area floors will be sloped away from the fuel storage tanks.
- Accumulated water from precipitation within a containment area will be monitored weekly and removed using a vacuum truck for appropriate off -site disposal.
- The containment berm at a tank farm containing a single tank must be of sufficient size to contain the volume of the tank plus 10%. For a multi-tank farm facility, the berm must contain 110% of the largest tank or 100% of the largest tank plus 10% of the aggregate volume of all tanks within the berm, whichever is greater.
- Where a geosynthetic membrane is used in a containment berm, ensure that it is always covered with a protective layer of geotextile and soil.
- Stationary double walled tanks will not be used exclusively for the purpose of containment for storage purposes. All stationary double walled tanks operated as part of a fuel storage and dispensing system should have some type of tertiary containment capable of containing accidental spillage from the tank, piping, or transfer system.

7.2 Engineered Systems

The preferred manner to deal with spills is by avoidance through embedded mechanisms (e.g., engineered prevention such as check valves, automatic shut offs, level gauges, alarms, etc.) within the storage, handling, and transportation activities. Reducing risks associated with spills starts with properly trained operators, well-designed fuel transfer systems, and good equipment maintenance.

Engineered systems that BW Gold will implement to assist in the prevention of spills can be found in the Chemical and Materials Storage, Transfer, and Handling Management Plan (BW Gold 2022b).

8.0 Spill Response Plan

Response to general TL construction emergencies is captured in the Mine Emergency Response Plan (MERP). The EPC contractor will use the MERP as a basis for developing the site-specific ERP for the TL. The spill response plan included in this Plan is specific to fuels. Spill response to all other chemicals is presented in the Chemical and Materials Storage, Transfer, and Handling Management Plan (BW Gold 2022b).

All spills, accidents, or observed instances of odour and/or petroleum product sheen in a watercourse will immediately be reported to the EM regardless of quantity or location (on-site or Project-related off-site). The EM is responsible for notification to mine management, Aboriginal Group Monitor(s), and any required reporting to outside agencies.

8.1 Fuel Spill Response Procedures

The following procedure summarizes the basis for actions in dealing with spills no matter the size:

1. Determine the risk (danger) to personal health and the environment. If possible, secure the area, identify substance and level of response required. Protect waterways from harm if possible.
2. If the spill is ongoing and if it is safe to do so, locate and stop the source of the spill from its source by eliminating the flow (e.g., shut off pumps, close valves, etc.).

Communicate that the spill has occurred to supervisor. Obtain required assistance from the appropriate staff, and external organizations if required (e.g., Police, Fire department, spill response contractors, etc.).

1. If the spill is or is likely to trigger provincial reporting threshold >100 litres of TDG Regulations Class 3 – flammable/combustible liquids or waste oil or the spill has or is likely to enter a water body, the supervisor will ensure that the spill or the imminent spill is immediately reported to EMBC by calling 1-800-663-3456. See Section 5.2 and 11.1 for external notification requirements.
2. Contain the spill to minimize contamination and prevent the spill from entering the environment. Block off drains, culverts, ditches and surround product with earth, hog fuel, peat, straw, sand, booms, or commercial sorbents (e.g., temporary berm, booms, and socks from the spill kit).
3. Absorb the spill using the pads, pillows, etc. in the kit. Scrape up contaminated soil and material.
4. Dispose of Contaminated Product[1]. Ensure the contaminated waste is treated appropriately (e.g., oil-soaked waste in marked bins separated from general waste bins). And all oil contaminated soil (OCS) is thoroughly cleaned up, placed in labelled drums, and disposed of as waste in a manner appropriate-, see the Waste (Refuse and Emissions) Management Plan (Appendix 9-M of the Application) for more information.
5. Conclude by reporting and investigating how the spill occurred, using incident investigation methods that result in immediate cause and root cause identification. As part of the investigation evaluate the historical record of spills to identify any past spills that were similar in occurrence and cause. Based on the above, develop a list of corrective actions that will help reduce the risk of future spills.

An Initial Report as outlined in section 4 of the Spill Reporting Regulation will be completed and submitted upon identification of a spill. Another End-of-Spill Report will be submitted within 30 days after the emergency response completion date for the spill as outlined in section 6 of the Spill Reporting Regulation.

If on-site trained personnel or on-site available spill response equipment cannot handle the spill, an external spill response contractor will be arranged to attend to the situation. The EM, in coordination with external consultants, will develop a plan for cleanup and remediation.

For Level 2 or 3 Spill (see Table 8.1-1), the BW Gold EM will notify all relevant agencies and stakeholders of the event. In the event of a large spill or a spill near waterways, the BW Gold EM will assess if contacting the mine site Emergency Response Plan Coordinator and mine site Incident Command is required to assist with the spill containment and damage mitigation.

Fuel Spill Classification

There are three levels of fuel spills, as defined in Table 8.1-1. For non-fuel spill material types and reportable quantities see prescribed substances and quantities for immediate spill reporting Spill Reporting Regulation (Appendix A).

Table 8.1-1: Spill Severity Classifications

Spill Severity	Description	Action Required	Example
Level 1	• Volume of fuel spill is small and contained on site and is less than BC reportable threshold quantity (100 L). • No risk to persons or environment. • Can be completely contained and cleaned up by on site employees	• Internally reportable with Spill Report procedure. • Clean up required.	Spill from overfill during fueling

[1] Section 8 of the Contaminated Sites Regulation.

Spill Severity	Description	Action Required	Example
Level 2	• Volume of fuel spill is greater than the BC reportable threshold quantity (100 L) or material enters or is likely to enter a body of water. • No significant danger to persons or environment. • Can be completely contained and cleaned up by on site employees and equipment.	• Notify Construction Manager and BW Gold EM. BW Gold EM will notify EMBC and Indigenous Nations. • Complete Spill Report. • Notify BW Gold Mine Manager. • Clean up and disposal as per EM.	Punctured drums Spill from equipment
Level 3	• Volume of fuel spill is greater than BC reportable threshold quantity (100 L) and spill may leave site boundaries. • Potential risk to persons in area or immediate environment. • May require additional off-site resources or consultation. • May be of media and public interest.	• Notify Construction Manager and BW Gold EM. BW Gold EM will notify EMBC and Indigenous Nations. • Complete Spill Report. • Complete Incident Investigation. • Notify Mine Manager. • Clean up actions may require input from Government agencies.	Overturned fuel transport truck Spill to a sensitive environment

8.2 Containment and Controlling Spills

In the event of a spill, stop the flow of petroleum products and eliminate any ignition sources, if possible. Individuals who are not members of the spill response team should leave the area immediately.

Prior to taking any action, ensure that a complete assessment is made to ensure that resources are used effectively. Use appropriate safety procedures and personal protective equipment. An intense and quick response is essential to minimize the potential impact on the environment.

Ensure a plan is established to safely respond to the spill:

- Determine safety and protective equipment for working in or around the spill.
- Provide first aid to injured persons.
- Monitor vapour levels if applicable (e.g., gasoline, flammable liquids).

8.2.1 Spill on Land

The following actions should be taken when there is a spill on soil, gravel, rock, or vegetation:

- Identify and delineate the perimeter of the spill.
- For larger spills, build a containment berm using soil material or snow and place a plastic tarp at the foot of the berm for easy capture of the spill after all vapors have dissipated.

- Remove the spill by using absorbent pads and/or by excavating the soil, gravel, or snow.
- Contaminated material should be placed into drums or other impermeable containers for transportation to an approved disposal facility.
- Remove the spill splashed on vegetation using particulate absorbent material if feasible.
- Larger spills can be removed by pumping the spill into labeled 205 litre drums.
- Dig a test pit to determine the depth of the spill.
- Excavate contaminated soils and subsoils until clean material is encountered or as per the direction of the EM. Collect confirmatory samples as required.

8.2.2 Spill on Water

The following actions should be taken when there is a spill on water:

- Contain spill to prevent further migration into the watercourse.
- Use a floating containment boom to capture spill for recovery after vapors have dissipated.
- Use absorbent pads to capture small spills.
- Use a skimmer for larger spills.
- Make a note of destination of the spilled product downstream.
- Place oil booms and skimmers downstream of the spill if appropriate.
- Identify eddies, pools or culverts that could potentially utilized in containing/diverting the spill.
- Note the depth and the velocity of the water.
- Note soils, vegetation, fish spawning areas, bird habitat, and wildlife.
- Identify any downstream areas and the rate of spread of the main slick.
- Visually inspect the foreshore to identify the extent of contamination.
- Note where the product is pooling along shore.
- Note any marsh areas that must be protected.

8.2.3 Spill on Snow/Ice

The following actions should be taken when there is a spill on snow or ice:

- Build a containment berm around the spill using snow.
- Remove the spill using absorbent pads or particulate absorbent material.
- Contaminated ice and snow must be scraped and shoveled into drums, and/or polypropylene bags, or other impermeable containers for transportation to an approved disposal facility.

8.2.4 Cleanup

Cleanup for Level 2 and 3 spills will include the following:

- Build a containment berm around the spill using earth, overburden, or gravel using heavy equipment (e.g., loader, dozer, or excavator).

- Excavate a sump using a backhoe, lining it with appropriate impervious material (e.g., tarp or poly), and diverting the spill into the sump.
- Block culverts with plywood, poly, and/or sandbags.
- Divert spill into site drainage sump and block inlet and/or outlet.
- Use absorbents (e.g., oil booms or pads) for hydrocarbon spills.
- Excavate contaminated soil and place in appropriate over pack labeled drums for disposal.
- Remove the spill splashed on vegetation using particulate absorbent material.
- Use emergency response kit.
- Use over pack barrel (310-L size) for containing a leaking 205-L barrel if the leak cannot be stopped.

8.2.5 Cleanup of Spill on Land

Additional considerations for a cleanup of Level 2 or 3 spills on land include the following actions:

- Remove the spill splashed on vegetation using particulate absorbent material if feasible.
- Larger spills can be removed by pumping the spill into labelled 205 litre drums.
- Dig recovery ditches around the perimeter (and pits within the spill area) to contain the spill.
- Monitor the ditches and pits to ensure the collection system are effective.
- Sample the soil to determine the extent of contamination.

8.2.6 Cleanup of Spill on Water

The following actions should be taken when there is a spill on water:

- Use a floating containment boom to capture spill for recovery after vapors have dissipated.
- Use absorbent pads to capture small spills.
- Use a skimmer for larger spills.
- In a ditch or stream, contain the spill using tarp containment system, underflow system or containment booms.
- In open water, divert the spilled product to the containment system using sorbent booms, synthetic booms.
- Use sorbent pads and/or pumps to collect the spill products from the containment area.
- Use a skimmer or suction pump (i.e., pump truck) if the volume is significant and the spill is contained.
- Develop a monitoring program to assess and remove free product over a given time frame.

If an emergency response is triggered, control of the situation will be transferred to the Emergency Response team. The team will be guided by the Mine Emergency Response Plan.

8.3 Disposal

Disposal of contaminated materials resulting from a spill cleanup will be determined by the EM with reference to the Safety Data Sheet and may include:

- Used materials collected and stored in sealed, labeled containers.
- All contaminated materials must be shipped off site, unless otherwise approved, in waste manifested loads taken by a carrier with a list of emergency contacts and emergency measures clearly indicated.
- Biocells or other on-site means using nutrients, soil, or other combinations thereof.
- Larger spills may warrant the use of on-site disposal and would be considered at that time (regulatory approval required).
- Section 52 of the Hazardous Waste Regulations is also an option for seeking some exemptions (disposal and/or transport) of any/all waste resulting from an emergency/ spill incident.
- Particulate sorbent used to treat spills, including, floating boom must be removed unless approved by the BC MOE.

9.0 Resource Inventory

9.1 Fuel Spill Kits

Fuel trucks and light duty vehicles that travel the surface mine roads will be equipped with the following materials to provide containment at the initial response of a hazardous spill. Operators of the vehicles will be responsible for maintenance of the spill kits:

9.2 Fuel Trucks and Light Duty Vehicles

Fuel trucks and light duty vehicles will be equipped with the following materials to provide containment at the initial response of a hazardous fuel spill. Operators of the vehicles will be responsible for maintenance of the spill kits:

- 25 absorbency pads;
- 13 litre bags of Oclansorb or equivalent;
- 4 Large plastic garbage bags;
- 1 roll heavy gauge poly for containment;
- 1 Shovel;
- 2 Plugs for burst gas tank or oil drum;
- 1 Watergate® barrier; and
- Although employees will be wearing basic site PPE, additional PPE will be included in the vehicle spill kits, such as extra gloves and safety goggles.

9.3 Fuel Storage and Fueling Areas

There are spill kits located in near storage areas containing fuel and at fueling sites. The spill kits will be easily accessible. These kits will contain:

- 50 absorbency pads;
- 4 of 4"×10' sorbent socks for booming;
- 1 container of plugging compound for sealing tanks or drums;
- Box of large plastic garbage bags;
- Box of vinyl gloves; and
- Plastic container to store used absorbents.

All kits are stored in a visible location in an appropriate weather-resistant container. Regular inspections of the kits are performed to ensure that kits are complete, and all materials remain functional and in sufficient quantities.

9.4 Equipment Inventory

A varying inventory of heavy equipment suitable for contingency during a fuel spill, will be on site at different phases of the construction. The Contractor Construction Manager and the Contractor Construction Superintendents will have a current list and locations schedule of heavy equipment and its availability for use.

The following equipment is representative of the type of heavy machinery to be located at various locations within the project area including the Mine Site, which will be available for spill contingencies on site specific basis:

- D10-R Caterpillar Dozer;
- 924G Caterpillar Loader;
- 2 of EX450 Hitachi Excavator;
- 16H Caterpillar Grader;
- 60 Ton Tadano Crane;
- 780 Champion Grader;
- 155A Komatsu Dozer;
- 416 Rubber Tired Backhoe;
- Bobcat; and
- Vacuum Truck.

9.5 Spill Response Kits

Spill response kits appropriate to the type and volume of material are appropriately specified for each piece of equipment that handles or transports contaminant materials (including fuel), including:

- Pickup trucks;
- Dump trucks;

- Commercial transport trucks;
- Excavation equipment; and
- Fuel trucks.

Spill response kits are located at appropriate material handling and storage locations, for the TL construction site this is mainly

- Fueling areas;
- Equipment caches; and
- Storage tank areas.

Spill response kit contents are based on the potential risk associated with the material, volume of material, and environmental sensitivity of the area. General kit contents include:

- Oil absorbent pads;
- Absorbent socks;
- Granular absorbent; and
- Protective equipment (e.g., gloves, goggles, protective suits).

All kits are stored in a visible location in an appropriate weather-resistant container. Regular inspections of the kits are performed to ensure that kits are complete and all materials remain functional.

10.0 Spill Response Evaluation and Remediation

Post-spill evaluation, monitoring, and remediation may be a requirement following a Level 2 or 3 spill. The BW Gold EM will consult with the Contractor Construction Manger to decide on the requirements.

Follow-up monitoring may be applicable in cases where there is a possibility that impact to the environment has occurred. This could include soil and surface water sampling near the area of a spill clean-up to ground, or the implementation of a groundwater monitoring program to document the environmental conditions of a Level 2 or 3 spill.

Proper sample collection is required to understand the nature of the material being discharged and to determine if the spill has resulted in an effect to the receiving environment. The sampling requirements for measuring the potential impact of a spill in the receiving environment will be provided in SOPs prior to the start of transmission line construction.

A digital camera should be taken to the site and pictures of the spill and receiving environment taken for documentation purposes. A variety of camera angles and both, close and distance photographs, are useful for preparation of spill reports. GPS points should be collected for all locations relevant to the spill (i.e., location spill occurred, downstream impact locations).

10.1 Corrective Action Plan

After initial response to arrest the source of the spill is completed a corrective action plan for remediation will be developed with consideration for potential downstream effects to wildlife and fish and fish habitat. As there are many possible scenarios, a prescriptive plan needs to be based on the receiving environment. substance spilled, and contaminant pathways.

11.0 Reporting and Record Keeping

11.1 Reporting

11.1.1 Monitoring Reporting and Contact Information

All spills, accidents, or observed instances of odour and/or petroleum product sheen in a watercourse will immediately be reported to the Contractor Construction Manager and the BW Gold EM regardless of quantity or location (on-site or Project-related off-site). The BW Gold EM is responsible for notification to mine management, Aboriginal Group Monitor(s), and any required reporting to outside agencies.

Not all contact numbers provided in Table 11.1-1 require notification for a particular spill. These numbers are intended to be a quick reference for the Contactor and Environment Manager who will determine the appropriate calls to make based on the particular spill's requirements. Other contact numbers may be added to this table for reference as needed.

Contact	Phone Number	Contact	Phone Number
Mine Manager (or delegate)	Tim Donnelly 604-558-1107	Emergency Management BC	1 800 663 3456
Environmental Department	Sarah Harrison 250-818-3765	Poison Control	911
Environmental Monitor	TBD	Spills - BC Environment	1 800 663 3456
Chief Inspector of Mines	250-952-0494	Deputy Chief Inspector of Mines	250-952-0471
BC Wildfire: • Phone • Cell	 250 565 6124 *5555	WorkSafe BC: • General • After Hours	 1 888 621 7233 1 866 922 4357
Conservation Office – Vanderhoof	250 567 6304	Department of Fisheries and Oceans (Prince George)	250-627-3499

Table 11.1-1: Spill Reporting Contact Numbers

Office	Phone	Email
Ulkatcho First Nation Office Chief Lynda Price ELOMC Representative – Vanesa Gottfriedson	250-742-3260	chief@ulkatcho.ca Vanessagottfriedson@ulkatcho.ca
Lhoosk'uz Dené Nation Chief Liliane Squinas Councilor June Baptiste ELOMC Representative Laurie Vaughn – Band Administrator Jeana Moore - Director	250-992-3290	lsquinas@lhooskuz.com Tsunie@lhooskuz.com Bandadministrator@lhooskuz.comNeba_nduwhulh'ih@lhooskuz.com

Office	Phone	Email
Nadleh Whut'en First Nation Chief Marten Louie ELOMC Representative – Kirsten Chapman Rose DaSilva	250-690-7211, ext. 113	chunih@nadleh.ca
Stellat'en First Nation Chief Robert Michell ELOMC Representative – Doug Casimel/Isaiah Reynolds	250-699-8747, ext. 31	Chief@stellaten.ca
Saik'uz First Nation Chief Priscilla Mueller ELOMC Representative – Kasandra Turbide	250-567-9293, ext. 220	priscilla.mueller@saikuz.com
Nazko First Nation Chief Leah Stump ELOMC Representative - Stephanie Deneault and Florian Bergoin	250-992-9085	leahstump@nazkoband.ca
Skin Tyee Nation Chief Rosemarie Skin	250-694-3517	chief@stfn.ca
Tŝilhqot'in Nation Chief Joe Alphonse	250-392-3918	TBC
Métis Nation British Columbia Collete Trudeau (Chief Executive Officer)	604-557-5851	ctrudeau@mnbc.ca
Nee-Tahi-Buhn Band Chief Marcella Morris	250-694-3494	Marcella.morris@ntbb.ca

11.1.2 Compliance Reporting

Under the Spill Reporting Regulation, a spill of a prescribed substance and quantity listed in the Schedule to the Regulation (Appendix A) must be reported if:

- the spill enters, or is likely to enter, any body of water at any time of the year, or
- the volume of the substance spilled is, or is likely to be spilled, is equal to or greater than the minimum quantity outlines listed quantity for the listed prescribed substance.

If a spill occurs or is at imminent risk of occurring, the BW Gold EM will ensure that the actual or potential spill is immediately reported to Emergency Management British Columbia by calling 1-800-663-3456, and that an Initial Report and End-of-Spill Report is filed as required by the Spill Reporting Regulation.

Table 11.1-2 identifies the reporting requirement and timeframes.

Table 11.1-2: Spill Reporting Requirements under the Spill Reporting Regulation

Spill Report	Content	Timeframe
Initial Report	When reporting a spill, the following information must be provided to the dispatcher: • The contact information for the individual making the report, the responsible person in relation to the spill, and the owner of the substance spilled; • The date and time of the spill; • The location of the spill site; • A description of the spill site and the surrounding area; • A description of the source of the spill; • The type and quantity of the substance spilled; • A description of the circumstances, cause, and adverse effects of the spill; • Details of any action taken or proposed to comply with Section 91.2 (2) of the Act (Responsible Persons - spill response fact sheet (PDF)); • Names of any provincial, federal, local, and/or first nation government agencies at the spill site; and • The names of any other persons or government agencies advised about the spill.	Immediately.
Update Report	See information available in the End-of-Spill Report that is available at that time.	This report is required if any of the following three conditions are present: • As soon as possible at the request of the Minister; • At least once every 30 days after the date that the spill began until such time that the End-of-Spill Report is required; and • At any time, the responsible person has reason to believe that information previously reported as part of the Initial Report was or has become inaccurate.

Spill Report	Content	Timeframe
End-of-Spill Report	The End-of-Spill Report must include the following information: a. the contact information of: (i) the responsible person; and (ii) the owner of the substance spilled; b. the date, time, and duration of the spill; c. the location of the spill site, which must be specified by: (i) its address, if any; and (ii) its latitude and longitude; d. a description of the spill site and sites affected by the spill; e. a description of the source of the spill; f. the type and quantity of the substance spilled; g. a description of the circumstances, cause, and adverse effects of the spill, including, without limitation, a description of the following: (i) the activity during which the spill occurred (e.g., transportation, transfer of cargo, fuelling, cleaning, maintenance); (ii) the incident leading to the spill (e.g., tank rupture, overfill, collision, rollover, derailment, fire, explosion); (iii) the underlying cause of the spill (e.g., human error, external conditions, organizational or management failure); (iv) the adverse effects of the spill to human health, which must specify: A. the number of injuries, B. the number of fatalities, and C. the number of evacuees; (v) the adverse effects of the spill to the environment and infrastructure at the spill site and the area surrounding the spill, which description must specify: A. the size of the area adversely affected by the spill,	If required, this report must be submitted within 30 days of the emergency response completion date of the spill.

Spill Report	Content	Timeframe
	B. the biological and other resources adversely affected by the spill, including, without limitation: 1. bodies of water, 2. flora and fauna, and 3. animal, fish, and plant habitat; h. details of action taken to comply with section 91.2 [responsible persons — spill response] of the Act; i. how and where waste from the spill was disposed of; j. a copy of data from and reports of sampling, testing, monitoring, and assessing carried out during spill response actions; k. a map of the spill site and the area surrounding the spill and photographs of the spill; l. the names of agencies on the scene; and m. the names of other persons or agencies advised about the spill.	
Learned-Lesson Report	Must include: a. a description of the effectiveness of the spill response actions; b. a description of actions taken to prevent future spills and improve response to future spills; c. if the responsible person is a regulated person: (i) a description of any changes that the person intends to make to the person's spill contingency plan to improve response to future spills; (ii) if the spill occurred in a geographic response area, a description of any changes that the person considers should be made to the related geographic response plan to improve response to future spills; (iii) if spill response actions were carried out by a PRO, a description of any changes that the person considers should be made to the PRO's area response plan to improve response to future spills; and d. responses to any specific questions the director asks in the order.	When ordered to provide.

11.1.3 Incident Reporting

All spills will be reported and ranked for severity, with corrective actions assigned for follow up and completion. Significant events will trigger an incident investigation (including a root cause analysis). Investigations will be done by senior staff from relevant Managers. Corrective actions may involve:

- Additional training for personnel;
- Enhanced equipment maintenance or inspection program; and
- Additional preventative infrastructure (containment berms, oil/water separators), etc.

The performance of the Transmission Line FMSCP will also be reviewed and updated as necessary.

11.2 Record Keeping

The following documents will be kept on hand and available on the workplace intranet:

- Transmission Line Industrial and Domestic Waste Management Plan;
- Chemical and Materials Storage, Transfer, and Handling Management Plan for the Mine Site (BW Gold 2022b);
- Transmission Line Fuel Management and Spill Control Management Plan;
- Mine Emergency Response Plan; and
- TL Emergency Response Plan (as developed by the EPC Contractor).

Records of all updates to these plans and audits/spill exercises performed to determine the adequacy of the plan must be stored with the plan for the entirety of the Transmission Line construction.

The record of the fuel spill exercises will include:

- Date and time;
- Substance (theoretically) spilled;
- Participants involved in the exercise;
- Diary of the events of the response; and
- Follow-up meeting with the individuals involved to identify potential improvements that are required and to the FMSCP or training are required.

11.3 Incident Response Records

A database of fuel spills will be maintained on site that will include information on current status of remedial activities. Statistics on incidents of spills will be provided to the BW Gold EM monthly.
The outcomes of investigations following significant spills will be presented to BW Gold and Contractor supervisors and personal and used to prevent potential future spill incidents.

12.0 Evaluation and Adaptive Management

The Transmission Line FMSCP will be reviewed at the mid point of the transmission line construction schedule by the Construction Manager and the BW Gold EM or delegated QP. The review will evaluate the effectiveness of fuel management, spill prevention, and spill response and contingency matters. Performance metrics that will result in adaptive management are:

- Non-compliance with this plan;
- Measure of mitigation success;
- Response time;
- Number of known unreported spills;
- Number of reported spills;
- Timely completion of maintenance and inspections;
- Completion of required training; and
- Regulatory non-compliance orders associated with the plan.

13.0 Plan Revision

The Transmission Line FMSCP is a “living” document and and any plan revisions will be made in accordance with the plan this is appended to (Condition 13 – Construction Environmental Management Plan).

14.0 Qualified Professionals

Under the direction of Allnorth Consultants Limited, this management plan has been prepared and reviewed by, or under the direct supervision of, the following QP:

Prepared by:	Reviewed by:
Original signed	*Original signed*
Mike Padula Project Manager	David Watt, R.P.F. Registered Professional Forester

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Appendix A Prescribed Substances and Quantities for Immediate Spill Reporting

From: Spill Reporting Regulation (BC Reg. 221/2017)

Item	Substance Spilled	Specified Amount
1	Class 1, Explosives as defined in section 2.9 of the Transportation of Dangerous Goods (TDG) Regulations	50 kg, or less if the substance poses a danger to public safety
2	Class 2.1, Flammable Gases, other than natural gas, as defined in section 2.14 (a) of the TDG Regulations	10 kg
3	Class 2.2 Non-flammable and Non-toxic Gases as defined in section 2.14 (b) of the TDG Regulations	10 kg
4	Class 2.3, Toxic Gases as defined in section 2.14 (c) of the TDG Regulations	5 kg
5	Class 3, Flammable Liquids as defined in section 2.18 of the TDG Regulations	100 L
6	Class 4, Flammable Solids as defined in section 2.20 of the TDG Regulations	25 kg
7	Class 5.1, Oxidizing Substances as defined in section 2.24 (a) of the TDG Regulations	50 kg or 50 L
8	Class 5.2, Organic Peroxides as defined in section 2.24 (b) of the TDG Regulations	1 kg or 1 L
9	Class 6.1, Toxic Substances as defined in section 2.27 (a) of the TDG Regulations	5 kg or 5 L
10	Class 6.2, Infectious Substances as defined in section 2.27 (b) of the TDG Regulations	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
11	Class 7, Radioactive Materials as defined in section 2.37 of the TDG Regulations	Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in section 20 of the Packaging and Transport of Nuclear Substances Regulations, 2015 (Canada)
12	Class 8, Corrosives as defined in section 2.40 of the TDG Regulations	5 kg or 5 L
13	Class 9, Miscellaneous Products, Substances or Organisms as defined in section 2.43 of the TDG Regulations	25 kg or 25 L
14	Waste containing dioxin as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment

Item	Substance Spilled	Specified Amount
15	Leachable toxic waste as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
16	Waste containing polycyclic aromatic hydrocarbon as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
17	Waste asbestos as defined in section 1 of the Hazardous Waste Regulation	50 kg
18	Waste oil as defined in section 1 of the Hazardous Waste Regulation	100 L
19	Waste that contains a pest control product as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
20	PCB wastes as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
21	Waste containing tetrachloroethylene as defined in section 1 of the Hazardous Waste Regulation	50 kg or 50 L
22	Biomedical waste as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
23	A hazardous waste as defined in section 1 of the Hazardous Waste Regulation and not covered under items 1 to 22	25 kg or 25 L
24	A substance, not covered by items 1 to 23, that can cause pollution	200 kg or 200 L
25	Natural gas	10 kg

Appendix B WHMIS Label Example

Appendix C Fuel Storage Risk Assessment Table

Tank Location: _____ Inspector: _____ Inspection Date: _____

Risk Identification	Risk Rank High	Risk Rank Medium	Risk Rank Low	Assigned Numerical Value
Numerical Value	**3**	**2**	**1**	
Distance to nearest water course **Note: storage and refuelling sites are NOT to be within a Riparian Management Area**	Less than 50 m	50 m -100 m	Greater than 100 m	
Amount of traffic	High traffic road, close to traffic (Main Line)	Through road, little traffic	Logging road, no through traffic, little traffic	
Volume of fuel stored at the site	Greater than 4500 L	500 L- 4500 L	Less than 500 L	
Duration the tank / cache is in present location	Greater than 45 days	11-45 days	Less than 11 days	
Characteristic of soil at the fuel tank / cache location	Porous or unknown	Semi-porous	Non-porous clay/bedrock/frozen	
Slope of terrain surrounding the fuel tank / cache site	Greater than 6% slope	2%-6% slope	Less than 2% slope	
Number of times the fuel facility is used per day	Greater than 12 times per day	6 -12 times per day	Less than 6 times per day	
Type of tank & spill containment in use	Tank with no secondary containment	Tank with secondary containment	Tank with secondary containment and additional spill controls (i.e., berms, sloped to a sump)	
Spill Training	Operators spill training more than 4 years old	Operators spill training 2-3 years old	Operators trained within past 2 years	
Distance to additional spill response equipment	Greater than 60 minutes	15 - 60 minutes	Less than 15 minutes	
Risk Value	**Add the Assigned Numerical Values**			

Spill Control Measures Determination

Numerical Value Total	Risk Ranking	Additional Spill Control Measures Required
Less than 12 points	Low Risk	None
12 – 23 points	Medium Risk	No additional spill control required but should be considered.
Greater than 23 points	High Risk	Move tank or provide additional spill control measures.