BW GOLD LTD
a subsidiary company of Artemis Gold Inc

Blackwater Gold Project

Construction Environmental Management Plan

May 2022

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

Aboriginal Groups	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)
AEMP	Aquatic Effects Monitoring Program
AQDMP	Air Quality and Fugitive Dust Management Plan
Artemis	Artemis Gold Inc.
BC	British Columbia
Blackwater or Project	Blackwater Project or 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
EAO	BC Environmental Assessment Office
EAO	Environmental Assessment Office
ECCC	Environment and Climate Change Canada
EIR	Environmental Incident Report
EM	Environmental Manager
EMBC	Emergency Management BC
EMC	Environmental Management Committee
EMLI	Ministry of Energy, Mines and Low Carbon Innovation
EMS	Environmental Management System
ENV	Ministry of Environment and Climate Change Strategy

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 groups or Aboriginal Peoples	Lhoosk'uz Dené Nation, Ulkatcho First Nation, Nadleh Whut'en First Nation, Saik'uz First Nation, Stellat'en First Nation, Nazko First Nation, Skin Tyee Nation, Tŝilhqot'in Nation, Métis Nation British Columbia, and Nee-Tahi-Buhn Band (as defined in the Project's federal Decision Statement)
IPMP	Invasive Plants Management Plan
IRTB	Independent Tailings Review Board
JAIR or Joint MA/EMA Application	Joint Application Information Requirements for *Mines Act and Environmental Management Act* Permits
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. PROJECT OVERVIEW

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

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. The Kluskus FSR joins Highway 16 approximately 10 km west of Vanderhoof. A new, approximately 13.8 km road (Mine Access Road; MAR) 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, 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 (kV) 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, Saik'uz First Nation, and Stellat'en First Nation (collectively, the Carrier Sekani First Nations) as well as the traditional territories of the Nazko First Nation, 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) or 5.5 million tonnes per annum (Mtpa) for the first five years of operation. After the first five years, the milling capacity will increase to 33,000 t/d or 12 Mtpa for the next five-years, and to 55,000 t/d or 20 Mtpa in Year 11 until the end of the 23-year mine life. The Closure phase is 24 to approximately 45 years, ending when the Open Pit has filled and the Tailings Storage Facility (TSF) is allowed to passively discharge to Davidson Creek, and the Post-closure phase is 46+ years.

New Gold Inc. (New Gold) received Environmental Assessment Certificate #M19-01 (EAC) on June 21, 2019 under the *Environmental Assessment Act* (2002) (BC EAO 2019c) 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 *Environmental Assessment Act* (2018). 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.

2. 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. Many of the plans are a requirement of the JAIR and therefore refer to *Mines Act* and *Environmental Management Act* Application (hereafter referred to as the Application) components.

Attachment List

- Attachment 1: Air Quality and Fugitive Dust Management Plan (AQDMP) [Appendix 9-O of the Application];
- Attachment 2: Aquatic Effects Monitoring Program (AEMP) [Appendix 7-A of the Application];
- 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) [Appendix 9-M of the Application];
- Attachment 5: Cultural and Spiritual Resources Management Plan;
- Attachment 6: Fuel Management and Spill Control Plan (FMSCP) [Appendix 9-L of the Application];
- Attachment 7: Invasive Plant Management Plan (IPMP) [Appendix 9-G of the Application];
- Attachment 8: Metal Leaching/Acid Rock Drainage (ML/ARD) Management Plan (ML/ARDMP) [Appendix 9-D of the Application];
- Attachment 9: Mine Emergency Response Plan (MERP) [Appendix 9-J of the Application];
- Attachment 10: Mine Site Traffic Control Plan (MSTCP) [Appendix 9-K of the Application];
- Attachment 11: Mine Site Water and Discharge Management Plan (MSDP) [Appendix 9-E of the Application];
- Attachment 12: Noise and Vibration Management Plan (NVMP);
- Attachment 13: Occupational Health and Safety Program [Chapter 8 of the Application];
- Attachment 14: Reclamation and Closure Plan (RCP) [Chapter 4 of the Application];

- Attachment 15: Soil Management Plan (SMP) [Appendix 9-B of the Application];
- Attachment 16: Surface Erosion Prevention and Sediment Control Plan (SEPSCP) [Appendix 9-A of the Application];
- Attachment 17: Vegetation Management Plan (VMP) [Appendix 9-F of the Application];
- Attachment 18: Waste (Refuse and Emissions) Management Plan (WMP) [Appendix 9-N of the Application];
- Attachment 19: Wetland Management and Offsetting Plan (WMOP); and
- Attachment 20: Wildlife Mitigation and Monitoring Plan (WMMP) [Appendix 9-H of the Application].

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 (Appendix 9-O of the Application)	■ Fugitive Dust Management Standard Operating Procedure
Invasive Plant Management Plan (Appendix 9-G of the Application)	■ Invasive Plant Management Standard Operating Procedure ■ Invasive Plant Monitoring Standard Operating Procedure
Vegetation Management Plan (Appendix 9-F of the Application)	■ 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 (Appendix 9-D of the Application)	■ Waste Rock and Ore Grade Control Monitoring Standard Operating Procedure ■ Overburden Monitoring Standard Operating Procedure

3. 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 3.1-1 provides an overview of general environmental management responsibilities during construction and operations life for key positions that will be involved in environmental management. Other positions not specifically listed in Table 3.1-1 but who will provide supporting roles include independent environmental monitors, an Engineer of Record (EOR) for each tailings storage facility and dam, an Independent Tailings Review Board (ITRB), TSF qualified person, geochemistry qualified professional, and other qualified persons and qualified professionals.

Table 3.1-1: 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 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 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 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 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 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 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 implementation of the EMS relevant to their areas. Report to 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 VP Environment & Social Responsibility.
Community Relations Advisor	Community Relations Advisor is responsible for managing the Community Liaison Committee and Community Feedback Mechanism. Reports to Indigenous Relations Manager.

Role	Responsibility
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 EM.
Aboriginal Monitors	Aboriginal Monitors are required under EAC condition 17 and will be responsible for monitoring for potential effects from the Project on the Indigenous interests. Indigenous Monitors will be involved in the adaptive management and follow-up monitoring programs. Report to EM.
Employees and Contractors	Employees 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 EMPs and social MPs.

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 qualified professionals 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 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 EPCM 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 PM 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 EPCM contracts. The EPCM contractors will report to the CM's 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 MPs. 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 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 Project's EAC, BW Gold has established an Environmental Monitoring Committee (EMC) 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), LDN, UFN, Nadleh Whut'en First Nation, Saik'uz First Nation, Stellat'en First Nation, Nazko First Nation, Ministry of Energy, Mines and Low Carbon Innovation (EMLI), Ministry of Environment and Climate Change Strategy (ENV) and Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD).

4. 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. The requirements in this CEMP will augment and in some instances may supersede construction-related requirements in Permit M-245 and Authorization 110662 with the issuance of *Mines Act* and *Environmental Management Act* permits based on this Application.

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 will require 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 2021a) and Fish Compensation Plan (Palmer 2021b) 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; and Mid-Mathews Pond 2. 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 are planned for 2022 to finish pre-construction surveys and identify additional offsetting sites.

Currently the Mathews Creek wetland complex is the primary wetland offsetting site. It was selected because there has been intensive agriculture and livestock grazing for the past 50 years which has resulted in degradation of the natural wetland ecosystem.

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.
- Where protected and/or restoration habitat areas for other wildlife (e.g., caribou, migratory birds, western toads) have been identified as offsets, implement measures within these areas (e.g., Capoose HE-UWR, caribou and wetland restoration areas) that are beneficial to bats.
- Augment habitat for bats by restoring wetland habitat that provides 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. 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. 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 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 (Timing to be confirmed based on approvals)	■ 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, WMP, 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. ■ Energize site with electrical power from grid connection. ■ Install site security, communications, first aid and emergency response facilities. ■ Decommissioning of Exploration Access Road.

7. 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. Maps at greater detail (e.g., 1:5,000) will be prepared to support site-specific CEMPs.

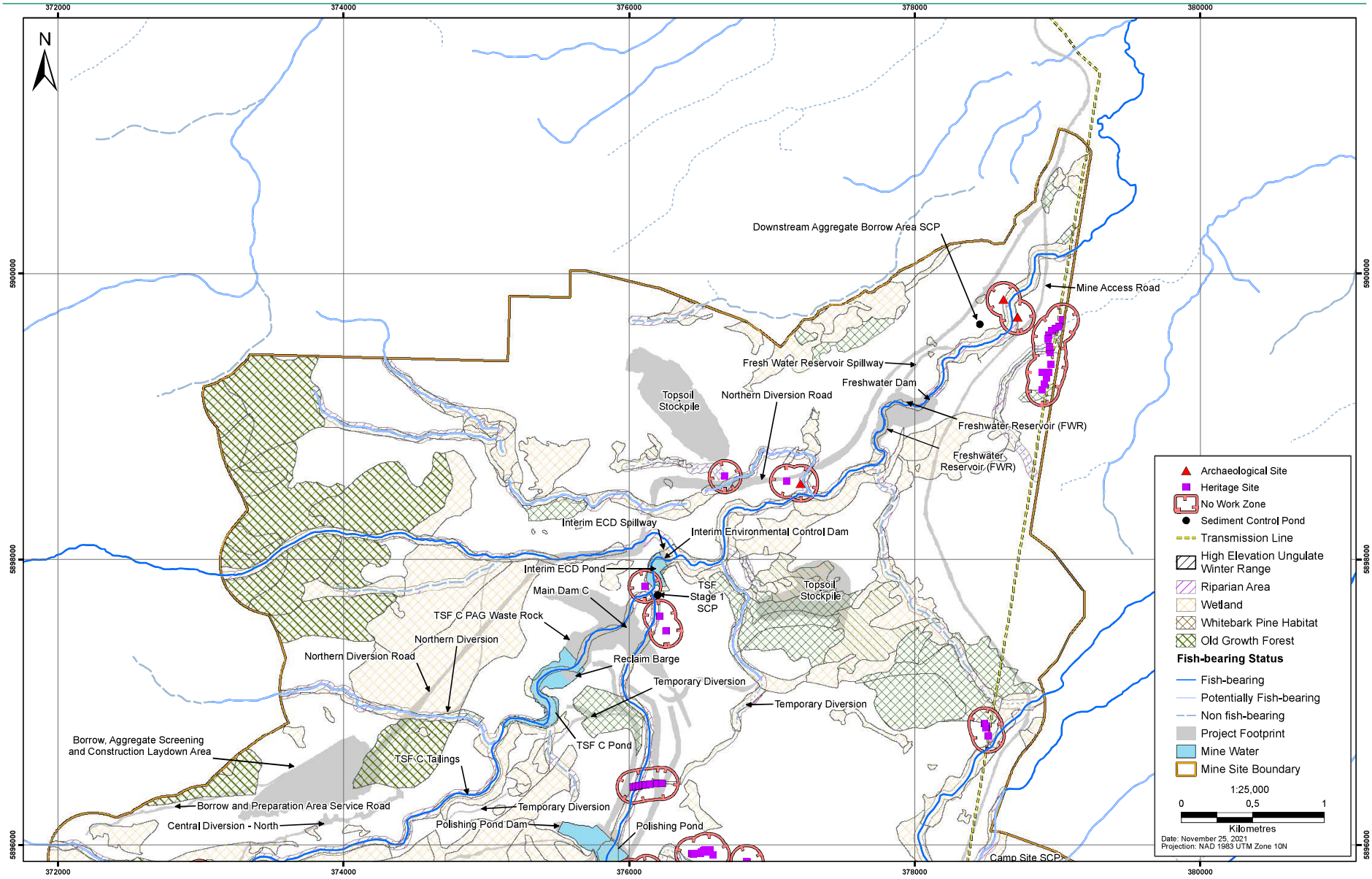

Figure 7-1: Environmental Constraints within Mine Site Certified Project Description Boundary (1 of 2)

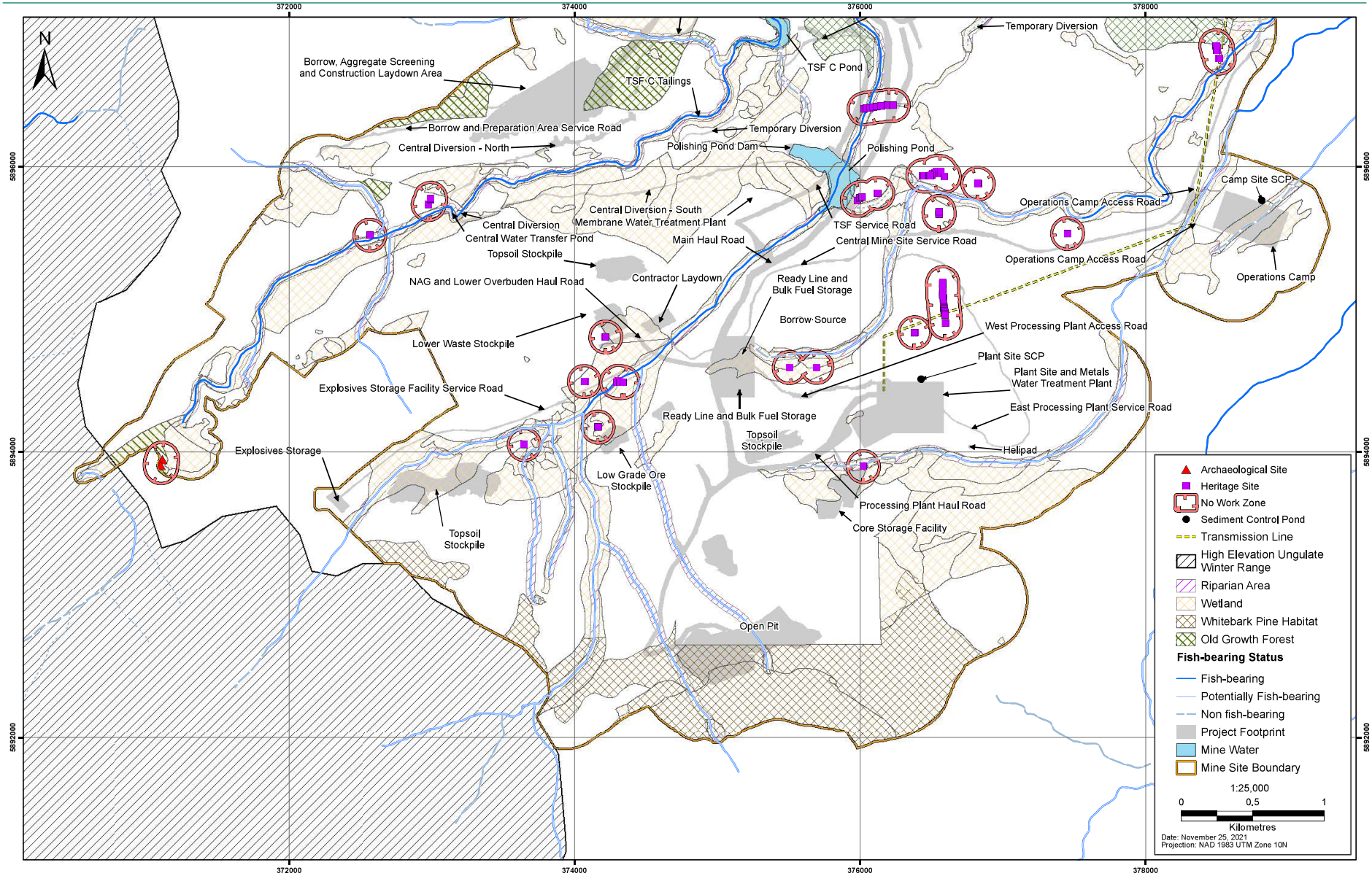

Figure 7-2: Environmental Constraints within Mine Site Certified Project Description Boundary (2 of 2)

8. 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 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 professionals such as the Environmental Monitor and federal or provincial government agencies may also be consulted.

9. 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.
	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.

Category	Mitigation/Management Measure
	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.
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).

Category	Mitigation/Management Measure
	Select equipment with industry standard noise abatement technology, including exhaust, and compressor/fan noise.
	Use a noise-attenuating jacket around jackhammers.
	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 mobile equipment and light vehicles.
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; site-specific erosion and sediment control plans and associated activities will be provided on the Issued for Construction (IFC) drawings which are not available at this time. 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 (ESC) measures will be field-fit by the EPCM Contractor based on conditions encountered in the field.

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 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.
	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 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].
  - 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 professionals based on parent-material characteristics. Maps of parent-material polygons will also be available to guide operators and supervising qualified professionals in delineating areas of the different reclamation materials. Supervising qualified 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:

- Stockpiles will be 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 (overburden, glaciofluvial surface soil, mixed-mineral surface soil, and organic surface soil; see also Figure 10.1-1 of the SMP); and
- Construct stockpiles in accordance with the geotechnical stability standards required by the Code and engineering design (see Section 10.2 of the SMP).

[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 overburdern (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.

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.
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 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.
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).
	Develop new borrow areas only when and as required (to be determined by the Mine Manager).
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.
	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 be provided with constructive instruction on the importance of adhering to speed limits to limit dust generation. Repeat offenders may face disciplinary measures.
	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.
	Use coarse aggregate on roads with low silt content to reduce silt loading on roads.
Vehicles	Maintain equipment in good working condition according to manufacturer's recommendations.

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 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

Activity	Mitigation/Management Measure
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).
	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 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 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 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.
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.

Category	Mitigation/Management Measure
	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	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 Table 8.2-3 of the IPMP.
	Comply with the Stellat'en First Nation and Nadleh Whut'en First Nation herbicide policies in their Traditional Territories (applicable to the transmission line).
	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).
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 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 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.

Category	Mitigation/Management Measure
	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	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.
	Comply with the StFN and NWFN Nation herbicide policy 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

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	BW Gold acknowledges that the current WMOP does not enable the Project to achieve its no-net-loss of wetland function obligation. To that end, no wetlands will be impacted until additional baseline studies are completed in 2022. Until additional baseline studies in the mine site and the offsetting site are complete and the baseline data is reported to all required groups, BW Gold will not conduct any activities within 30 m of a wetland delineated by a qualified professional. Where wetlands have not been delineated by a qualified professional, BW Gold will not conduct any activities within 30 m of any Terrestrial Ecosystem Mapping polygon having the potential to contain a wetland.
	Maintain drainage pathways and wetland hydrology by installing appropriately sized culverts for stream and wetland crossings in accordance with the respective engineering design report (e.g., Allnorth 2013).
	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.
	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,

Category	Mitigation Measure
	hay bales, multi-barrier approaches, at the direction of the environmental monitor and supported by the QP (CEPSPC).
	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 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;

Category	Mitigation/Management Measure
	■ 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.
	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 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;

Category	Mitigation/Management Measure
	■ 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).
	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 professional.
	Road salts will not be used for de-icing, unless as determined by the Mine Manager (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 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.
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 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 professional as follows (in accordance with DS Condition 8.11):

Category	Mitigation/Management Measure
	■ 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 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 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)	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 professional prior to disturbance to determine whether bats are using the area and provide direction to the CM.
	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). 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).
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; ■ Schedule construction activities at noise sensitive locations and times; and ■ Avoid low altitude flights except on final approach and take-off.
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 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
	■ 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, 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 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, 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.
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:

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.

9.11.2.1 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 that

might work in wetland areas, including construction and clearing equipment following protocols provided in Appendix D.

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*.

9.11.2.2 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 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

Category	Mitigation/Management Measure
	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.
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 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: o maintaining an undisturbed vegetated buffer zone between areas of on-land activity and the high water mark of any water body o using existing trails, roads or cut lines wherever possible o avoiding tree removal o using methods to prevent soil compaction, such as swamp mats or pads ■ Prevent the harmful alteration, disruption or destruction of fish habitat by avoiding: o conducting any work, undertaking or activity in water o placing fill or other temporary or permanent structures below the high water mark o fording of the watercourse o disturbing or removing materials from the banks, shoreline or waterbody bed, such as: ▪ sand ▪ rocks ▪ aquatic vegetation ▪ natural wood debris o 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 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.
	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: o Pickup trucks; o Dump trucks;

Category	Mitigation/Management Measure
	○ 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 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 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 professional will submit notification(s) to relevant authorities prior to undertaking Authorized Changes.
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.

Category	Mitigation/Management Measure
	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 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 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.
	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.
	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 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 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 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). 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. ■ 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.

Category	Mitigation/Management Measure
	■ Should impacts to the vegetation or ground surface since the previous observation be observed at sites, the Project Archaeologist and the Archaeology Branch will be contacted to determine mitigation measures. ■ Should impacts be observed at heritage sites, the EM will contact Indigenous Knowledge Holder(s) to discuss mitigation measures.
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. 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);
- Environmental Code of Practice for Metal Mines (EC 2009); https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/code-practice-metal-mines/chapter-4.html;
- *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	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).
	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.

Topic/Activity	Mitigation/Management Measures
	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; 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.
	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.
	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.
	All fuel storage vessels will include a secondary containment in accordance with Section 2.2 or 3.2 of the Field Guide to Fuel Handling, Transportation, and Storage (BC MWLAP 2002).
	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.

Topic/Activity	Mitigation/Management Measures
	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.
	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.
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 m 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.
Inspections and Preventive Maintenance	Stationary fuel and dispensing stations and generator facility and fuel storage areas will be visually inspected on a daily basis. Inspections will be based on the type of tank and associated piping and include: ■ Checking pipes, valves, flanges, connections and pumps for leaks, discoloration or corrosion; ■ Checking the secondary containment is dry and clean of residue; ■ Checking the integrity of the liner and containment berm (fuel storage areas); and ■ Testing high-level, 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 BC Fire Code.
	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.
	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 2 weeks following a spill. 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.

Three types of spill kits are kept at BW Gold facilities and sites as described in the following sections.

10.3.1 Level "A" Spill Response Kit – Mine Site

A large supply of spill response equipment, including personal protective equipment (PPE) for both oil and chemical spills, 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 – Mine Site

Quantity	Item	Quantity	Item
1	Container with lid or shed, includes inventory list	1	Watergate® Barrier or equivalent
		40	Heavy-duty oil spill disposal bags
8 bales	Sorbent booms (4 per bale) (10' × 5")	2	"No Smoking" signs
1 length	PVC 6x6 River Boom (25')	1 roll	"Caution Do Not Enter" tape
10 bales	Sorbent pads (100 pads to a bale)	4	Safety triangles
6 bales	Sorbent socks (12 per bale) (3" × 4')	2	Poly tarps (18' × 20')
1	Sorbent roll (150' × 30")	1 jar	Plug N' Dike
1	Sledge hammer (6 lbs)	4	Round-nose shovel
1 set	Tool kit (example tools: wire cutters, pliers, hammer, utility knife , nails)	200 feet	Polypropylene rope (1/4")
		1 box	Rags

Note: SCBAs and chemical suits are also located at the Mine Site proper (see Table 10.3-2).

Table 10.3-2: Personal Protective Equipment – Mine Site

Item	Quantity/Size	Early Works	Major Works
Coveralls (Tyvek or Saranex)	12-XL, 12-XXL	NA	X
Oil-resistant rubber boots	12 pairs	4 pairs	X
Chemical splash goggles with side shields- A/O (fit eyeglasses)	12 pairs	4 pairs	X
PVC, rubber, leather, and nitrile gloves	12 pairs	4 pairs	X
Dust respirators (NIOSH-approved)	12	NA	X
Cartridge respirators (NIOSH-approved)	12	NA	X
Cartridges for respirators (organic vapour, acid, base)	12	NA	X
SCBA, positive pressure full face piece	6	NA	X
Level B chemical suits (Hazmat)	6	NA	X
Life vests (Personal Flotation Devices)	6	2 PFDs	X
Rain gear sets	6XL, 2-XXL, 3XXXL	4 sets of rain gear	X
High visibility vests	6	4 vests	X
Fire proximity suit	6	NA	X
Gas monitors/detectors	3	NA	X
Hearing protection	5 packages	X	X
Sunblock	12-75 ml – SPF 60	X	X

10.3.2 Level "B" Spill Response Kit – Secondary Fuelling and Storage

Smaller caches of spill response materials will be kept at all fuel storage and transfer areas and clearly identified and readily accessible. 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. Level B kits will be maintained at the Bulk Fuel and Ready Line site during construction.

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 (18" × 18" × 3/8"; 1 bale in kit, 2 to be stored)
20	Heavy duty oil spill disposal bags
1	Round-nose shovel
1 pair	Chemical goggles - A/O (fit eyeglasses)

Quantity	Item
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, 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 (18" × 18" × 3/8"; 10 Oil, 10 Universal)
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 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. 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. 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 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. 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 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 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 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 Aboriginal 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 FLNRORD 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 throughout the life of the mine	100 m - 1 km	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, 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

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	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 Environmental Manager) in accordance with the WMMP and CMMP to reduce disturbance to caribou ■ Aircraft minimum altitude 400 m in the UWR where possible	-	BC FLNRO 2014
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 ○ 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 FLNRO 2014

14. 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. 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 will be reviewed and documented. A key outcome of task meeting is confirmation of environmental monitoring resources 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 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 and crew Tailgate Meetings. 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 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.

Minutes of these meetings will be maintained by the BW Gold Construction Manager.

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 Environmental Monitor and EPCM Contractor's Site Superintendent(s). Tailgate meetings, including content pertaining to environmental management and protection, will be documented by the Prime Contractor.

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, hold a Tailgate Meeting, and address environmental risks and mitigation due to changing conditions.

15. 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 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 Professional

A qualified professional who has appropriate training for delineating operationally salvageable areas and surface soil suitable for salvage will be present to supervise salvage operations. They will be required to clearly mark and/or communicate 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). Supervising qualified professionals will be responsible for designating the parent-material type of salvaged surface soil (i.e., glaciofluvial, mixed -mineral or organic) and the corresponding appropriate salvage depths and segregation. They will be present during salvage operations to verify compliance with the SMP and to collect soil samples of recently-stockpiled surface soil during salvage operations to confirm that the properties of salvaged surface soils meet suitability criteria.

[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.

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
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

15.5.1 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.

15.5.2 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.

15.5.3 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 will be installed at the exploration camp prior to the start of major works construction and 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 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 to supervise the construction activities, where necessary, who will determine the validity of a result deemed and whether it results from construction or other external factors. BW Gold anticipates that this will be a requirement of the ENV discharge permit. 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	Annual	May to October

Monitoring Activity	Measurable Parameter (s)	Frequency[1]	Timing
	■ 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		
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
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 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, 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 is anticipated to include:

1. The potential wetland near the plant site will be delineated with flagging and GPS coordinates by a QP from ERM and Indigenous Monitors from LDN and UFN will be invited to participate. The plant site tree clearing activity has also been flagged for the project IEM who will be 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 will be installed after the tree clearing to ensure any potential impacts to the delineated wetland from spring freshet are mitigated. This area will be monitored closely during the spring melt period. A post-trip report will be prepared and provided to Aboriginal Groups and the 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

15.9.1.1 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.

15.9.1.2 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.

15.9.1.3 Caribou

Please refer to the Caribou Mitigation and Monitoring Plan.

15.9.1.4 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.

15.9.1.5 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

15.9.1.6 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.

15.9.1.7 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

15.9.2.1 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.

15.9.2.2 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.

15.9.2.3 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).

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.

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
	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

Potential Effect	Wildlife Valued Components	Mitigation	Monitoring Method	Frequency
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

16. 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 professionals or qualified persons.

16.1 Internal Reporting

16.1.1 Weekly Report

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

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 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 Monitoring Committee

BW Gold has established the EMC 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 reports will be distributed to EMC 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

16.2.3.1 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 Aboriginal Groups within the timelines specified in Condition 5.

16.2.3.2 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.

16.2.3.3 Accidents and Malfunctions Reporting

Condition 36 sets out requirements to develop an Accidents and Malfunction Administration and Communication Plan. Accidents and malfunctions 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 (BW Gold has purchased Isometrix as their Environment, Health and Safety database). 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 Indigenous auditing purposes.

17. 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. 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. Proposed changes will be reviewed and discussed with the Blackwater Environmental Monitoring Committee and Aboriginal Groups prior to implementation. Revised versions of the CEMP will be dated, version controlled, signed and filed with the Chief Inspector of Mines, Environmental Assessment Office and Aboriginal Groups and posted to BW Gold’s Project website in accordance with EAC Condition 42(c).

19. QUALIFIED PROFESSIONALS

The contents of this 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 by>

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

20. 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)

Table A-1: 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	Condition	Location in Plan
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	
	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	Condition	Location in Plan
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	Condition	Location in Plan
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, 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; Section 12
	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
	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 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: Concordance with Federal Environmental Assessment Decision Statement Conditions

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 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.

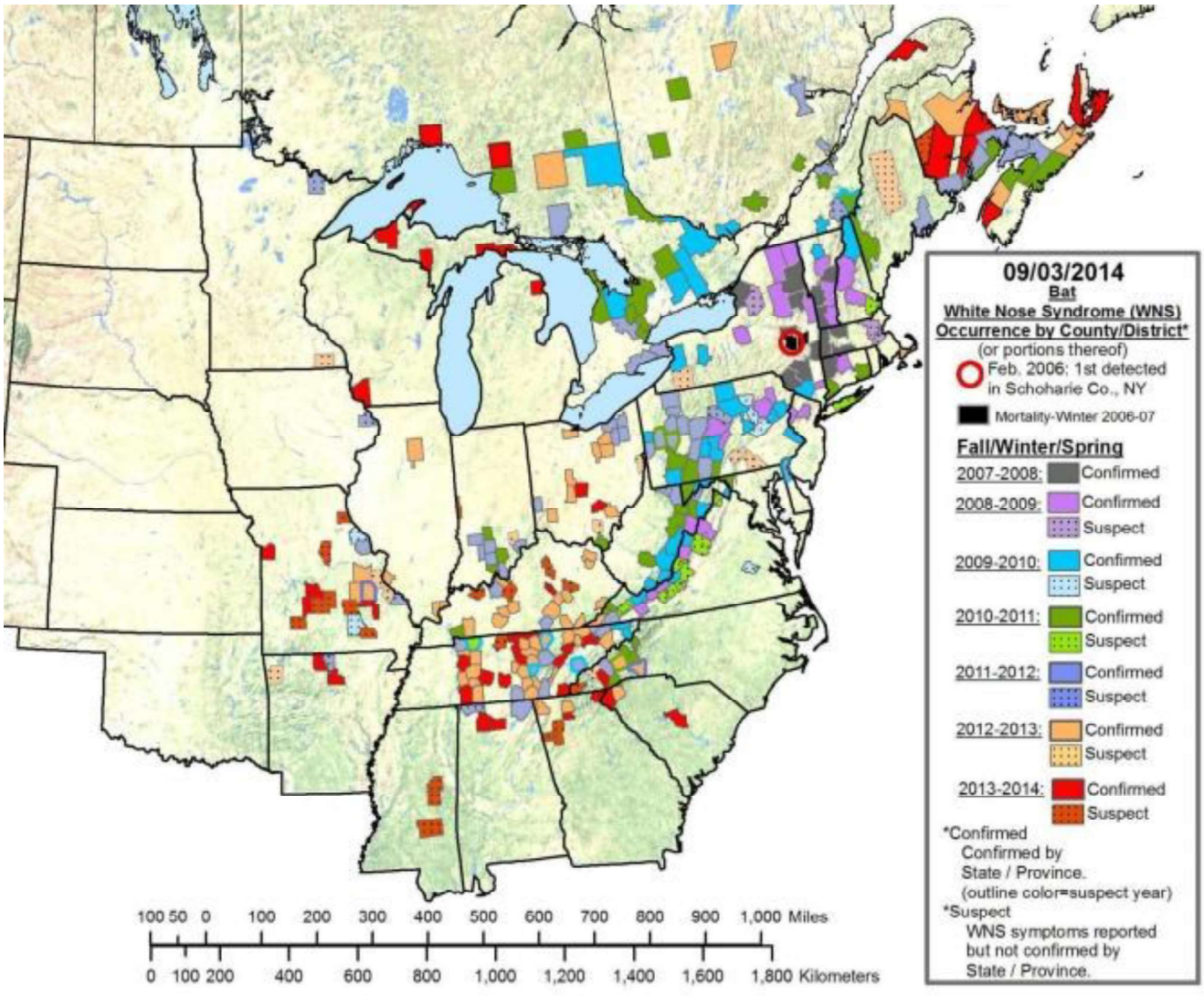
Scenario	Risk Level	Action	Description
You have been underground in western North America where *P.d. is not known to occur; bats or bat signs (e.g. guano, skeletons) were observed in the site.*	**Low**	**Report It** **Clean It**	Report your sightings, your information is critical to research. Thoroughly 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.

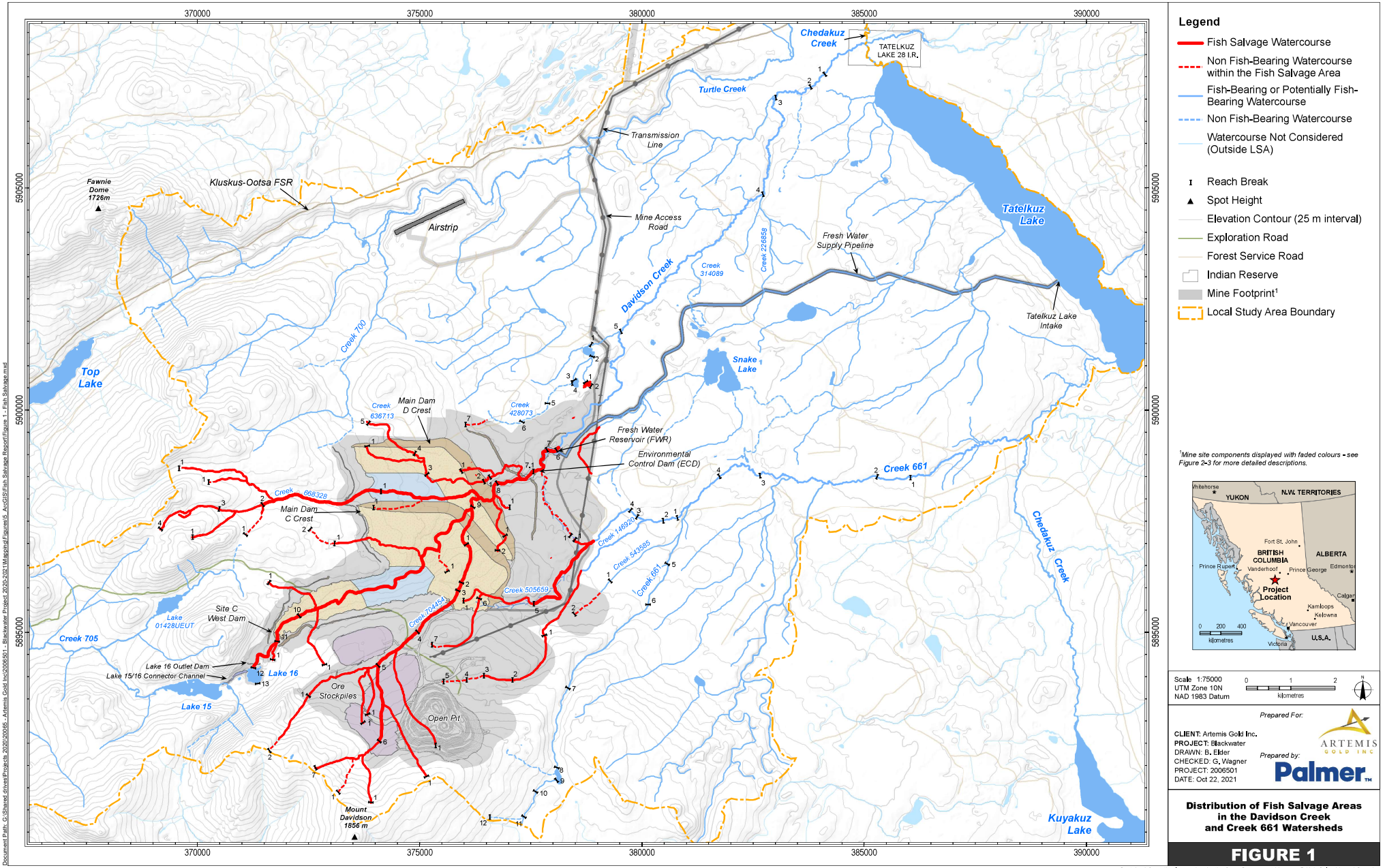
The number of fish within a sub-watershed (e.g., Creek 668328) or stream section (e.g., middle Davidson Creek; Reaches 6 to 10) was estimated by applying the mean density of fish across sampling sites in that area, to the total area of habitat in that sub-watershed or stream section. Reaches were aggregated, 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.



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:

ARTEMIS GOLD INC

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

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).

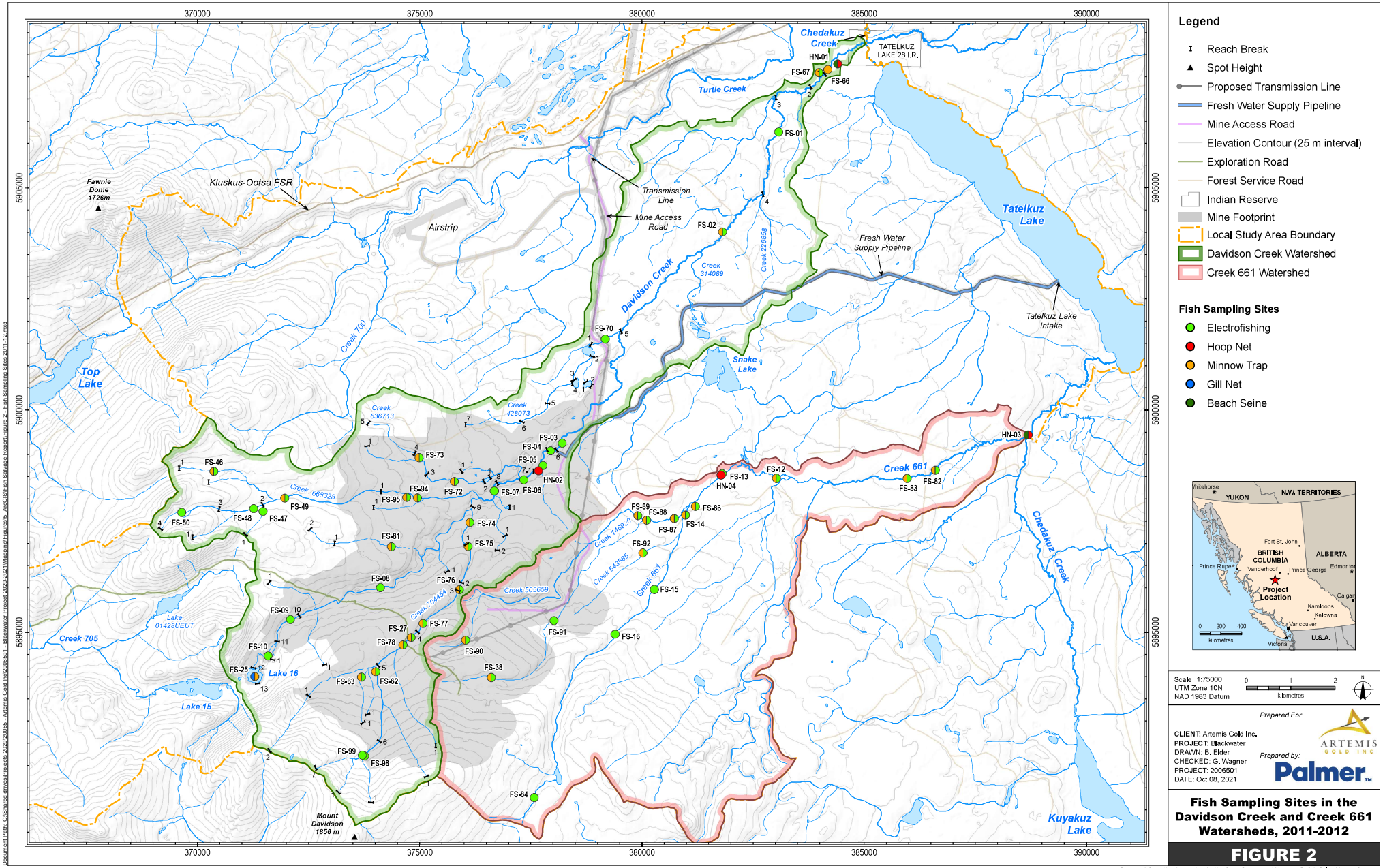
[2] The margin of error is 1.96 times the Standard Error (1.96 is the critical value for a 95% confidence interval).

[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).



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

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PROJECT: Blackwater
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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

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.

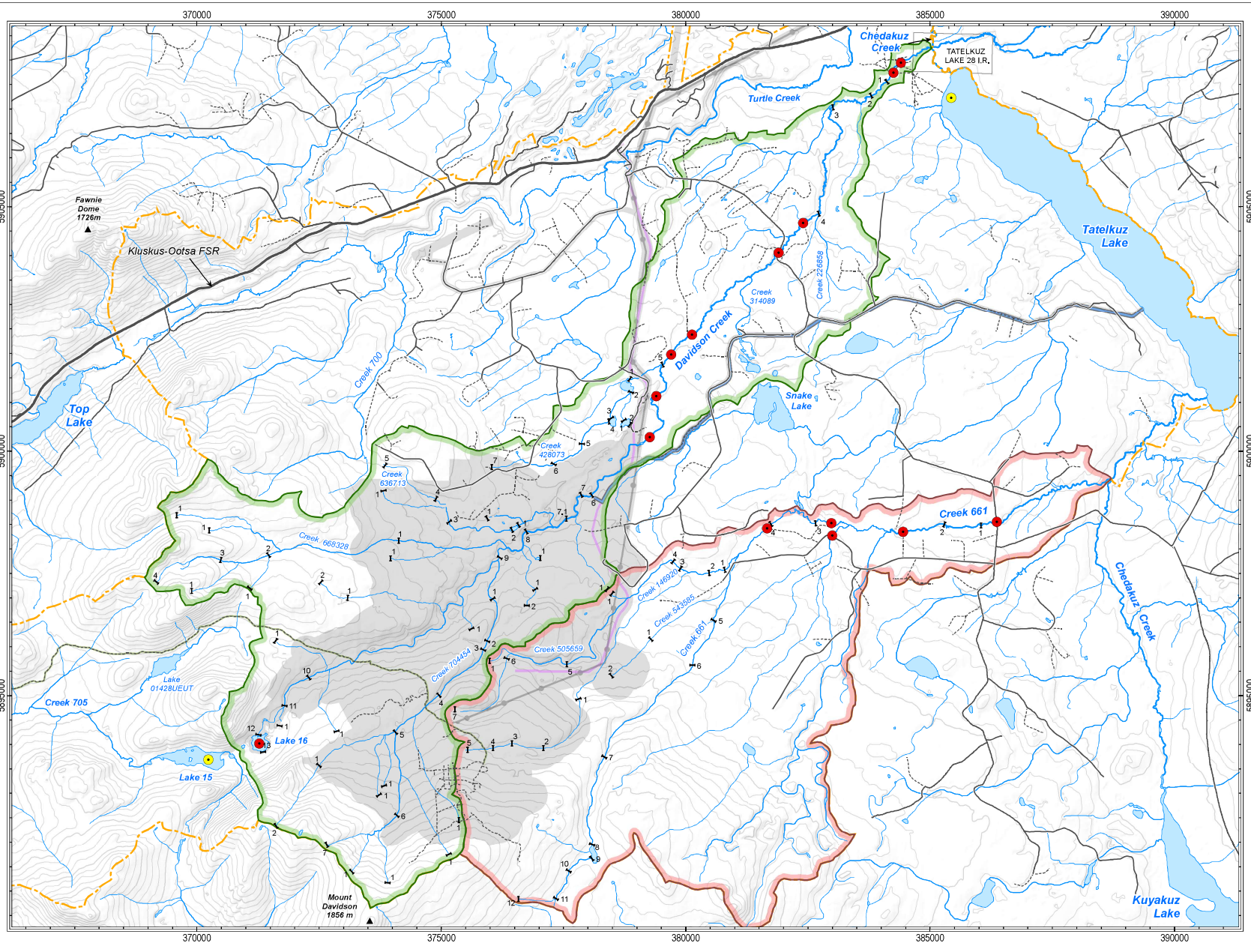
7. Determination of Suitable Fish Release Locations

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.



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

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PROJECT: Blackwater
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CHECKED: G. Wagner
PROJECT: 2006501
DATE: Oct 07, 2021

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Palmer

Potential Fish Relocation Sites in Davidson Creek and Creek 661

FIGURE 3

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.

Prepared By: <Original signed by>

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Approved By: <Original signed by>

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CEO

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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)