



## Working In or Near Streams and Wetlands

Taseko Mines Limited

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## 1.0 Purpose

This Environmental Protection and Management Plan (EPMP) is intended for works around streams, lakes and wetlands and their riparian areas.

Section 56 (2) of the BC Water Sustainability Regulation under the Water Sustainability Act exempts a person who holds a permit under section 10 of the *Mines Act* in relation to mineral exploration activities or placer mining activities until December 31, 2017 (as per order in council 895) from the requirement under section 6 (1) [use of water] of the Act to hold an authorization for the diversion and use of water for those activities.

Any activities that may cause harmful alteration, disruption or destruction of fish habitat, such as a crossing of fish-bearing waters, require referral to the Department of Fisheries and Oceans for an authorization under the Fisheries Act.

This EPMP is designed to meet the following goals:

- Minimize disturbance caused by exploration activities;
- Avoid any long-duration or irreversible impacts or changes on stream channels, water quality, aquatic ecosystems, and riparian habitat and vegetation, in order to avoid cumulative effects when considered along with other non-related activities in the area, and potential impacts on aboriginal interests;
- Manage all activities within riparian areas to maintain the integrity of the ecosystem; and,
- Prevent the introduction of deleterious substances into a stream, lake or wetland.

## 2.0 Existing Environment

The area contains fish bearing and non-fish bearing streams and wetlands (Figure 1).

Rainbow Trout are present in Fish Lake and Little Fish Lake; Middle and Upper Fish Creek; and in several other reaches of tributaries to Fish Creek and Fish Lake. Fish bearing waters are illustrated in Figure 1.

Wetlands mainly consist of fens and herbaceous meadows. Fens are either dominated by sedges or by willows and scrub birch with moderate covers of brown mosses. Herbaceous meadows and shrub-carrs are less common than fens but dominate fluvial plains that feed and drain Fish Lake. For instance, rich meadows with various flowering herbs, sedges and willow species are common adjacent to fluvial channels to the north and south of Fish Lake.

### 3.0 Management Plan Guidelines

#### 3.1 General Best Practices

- Work will be planned to take place at times when water conditions in streams and wetlands are manageable. In the event of significant rain events during exploration, contingencies should be in place to cease work around creeks and wetlands.
- Operations will be planned to avoid streams and wetlands as much as possible.
- Table 1 below defines setback distances for Riparian Management Areas (RMA) as identified in the Health, Safety and Reclamation Code for Mines in British Columbia.

**Table 1 – Riparian Management Areas (RMA): Setback Distances**  
(from the Health, Safety and Reclamation Code for Mines in British Columbia)

Riparian Type		Setback from Top-of-Bank (m)	
		Drilling	Exploration Access
<b>Stream (width in m)</b>	> 20 and <100	50	70
	>5 and ≤20	30	50
	≥1.5 and ≤5	20	40
	< 1.5	5	30
No fish	> 3	5	15
No fish	≤ 3	5	15
<b>Wetland (area in ha)</b>	≥ 5	10	30
	≥ 1 and <5	10	20
	≥ 0.25 and < 1	10	10
<b>Lake</b>		10	30

- As per Section 9.5.1 of the Health, Safety and Reclamation Code, some activities may be carried out within RMA setbacks. These activities include: construction, maintenance, deactivation and reclamation of stream crossings; access to set up and service water supply pumps and lines; and access to drill sites. Where works within RMA's cannot be avoided, practices outlined in Section 3.2 - Stream Crossings and Works within RMA's and Section 3.4 - Vegetation Removal should be followed.

## 3.2 Stream Crossings and Works within an RMA

### 3.2.1 General Measures

- In accordance with Section 9.10.1 of the Health, Safety and Reclamation Code:
  - (1) The construction, maintenance, deactivation and reclamation of exploration access and bridges or any other form of a stream, lake or wetland crossing shall result in exploration access and crossings that are stable, safe for the intended use and which
    - a. Minimize erosion, mass wasting or the degradation of a stream, lake or wetland by the introduction of sediment, debris or deleterious matter,
    - b. Minimize adverse impacts on stream channels
    - c. Make provision for drainage system that maintain stability of the road prism,
    - d. Do not cause harmful alteration, damage or destruction of fish habitat and,
    - e. Has the minimum surface disturbance necessary to complete the proposed work.
  - (8) Stream crossings shall be constructed, maintained, deactivated and reclaimed in a manner that allows safe fish passage and protects fish at, above and below stream crossings.
  - (9) Stream crossing on streams that do not contain fish shall be constructed, maintained, deactivated and reclaimed in a manner that does not adversely affect downstream fish values.
- Unless authorized, in accordance with the Fisheries Act, crossings must not cause:
  - Obstruction of fish migration;
  - Destruction of fish;
  - Harmful alteration, disruption, or destruction (HADD) of fish habitat unless authorized; or
  - Deposition of substances deleterious to fish in waters frequented by fish.

### 3.2.2 Sediment and Erosion Control Measures

- If in stream work is unavoidable, plan the work for periods of low flow or during appropriate reduced-risk work windows.
- If necessary, provide temporary drainage and pumping to keep construction sites free from water.
- Pump sediment laden water away from natural water bodies and onto a stable, flat, vegetated area.
- Implement and maintain sediment and erosion control measures to prevent sedimentation of watercourses; measures may include installation of silt fence, hay bales, check dams, water diversions, turbid water

collection sumps etc. Sediment and erosion control measures should be installed before construction works begin.

- Silt fence material is to be a woven, geotextile designed to reduce velocity of runoff to a point that allows suspended particles to settle out of the water.
- Exposed soils in areas that can contribute sediment to creeks should be stabilized and/or replanted as soon as practical to minimize the potential for erosion.

### **3.2.3 Locating Access Trails and Stream Crossings**

- Any crossing of fish bearing waters will be referred to the Department of Fisheries and Oceans for an authorization under the Fisheries Act.
- Crossings of fish bearing creeks will be constructed following best practices identifies in “Standards and Best Practices for Instream Works” and the “Fish-stream Crossing Guidebook” and will be constructed in a manner that allows fish passage and protects fish habitat above and below the steam crossing.
- At each crossing, the access trail will cross the riparian area and the stream at right angles to minimize the area of disturbance.
- Crossings should be located:
  - Where the stream channel is narrow and the banks are stable.
  - To avoid crossing in areas with fine or unstable bank materials.
  - To avoid crossings in areas with stable large woody debris.
- Stream crossings should not damage or block stream flow.
- Culvert crossings will follow culvert drainage designs in Chapter 4 - Road Drainage Construction in the “Forest Road Engineering Guidebook” (MOF 2002). Road drainage principals outlined in Chapter 4 include:
  - Installation of culverts at each stream;
  - Installation of cross drains with ditch blocks to reduce the erosional forces of water in ditches;
  - Ensuring that ditches discharge to forested areas and not directly into creek channels;
  - The use of appropriately sized culverts to accommodate stream flows; and,
  - The installation of extra and/or oversized culverts where trails cross an active floodplain
- If using log culverts, follow design specifications in Chapter 4 of the “Forest Road Engineering Guidebook”.
- Fill heights should be minimized within the active floodplain and the fill protected from erosion.
- Route access trails outside of RMAs and active floodplains and minimize stream crossings wherever possible.

- To minimize short and long-term impacts on the RMA, minimize widths of trail beds right-of-ways.

### **3.2.4 Equipment Operation**

- Minimize operation or transportation of mechanized equipment within the RMA, unless no practicable alternative route or work location exists or operating the machinery outside the RMA will create a higher risk of release of deleterious substances into the watercourse.
- If it is necessary to operate machinery within the RMA, locate the machinery outside the active channel, beyond the top of bank.
- Ensure equipment and machinery is in good operating condition, and is free of leaks, excess oil, and grease.
- Equipment servicing or fuelling should not occur within 30 m from any watercourse other than pumps and machinery that are:
  - hand-held;
  - required for firefighting;
  - broken down and require fuel or services in order to be moved; or
  - authorized by permit to be fuelled or serviced in the area.
- Any fuel or lubricant leaks will be captured and contained.

### **3.3 Waste and Pollution Control**

- Prevent the release of water containing sediment, debris or deleterious substances into RMAs and watercourses in accordance with Federal and Provincial legislative requirements.
- Do not store hazardous materials within the RMA.
- Maintain a spill kit with sufficient quantities of absorbent materials in the active work areas; spill kit should be available in close proximity to working machinery.
- Control runoff of water containing suspended sediment, debris or other deleterious substances in accordance with Federal and Provincial requirements
- Maintain temporary erosion and pollution control features.
- Dispose of solid waste, such as additive containers, rags, domestic refuse, and drill core boxes at an approved off-site facility. Provide suitable collection containers for use by contractors and crews.
- Never dispose of waste or volatile materials in RMAs or watercourses.
- Do not bury or burn waste materials.

### **3.4 Vegetation Removal**

- Minimize clearing native vegetation and topsoil and specifically try to avoid removing larger trees.
- Avoid grubbing or pulling up roots within the RMA.



- Fall and yard trees that need to be cleared away from RMAs and not into or across them.

### **3.5 Reclamation**

- Reclamation of any disturbances in riparian zones conducted as per Health, Safety and Reclamation Code for Mines in BC.
- Reclamation of exploration or access will be conducted as per Section 9.10.1 (7) of the Health, Safety and Reclamation Code for Mines in BC and will result in:
  - Restoration of drainage patterns;
  - Removal of bridge superstructures;
  - Removal of bridge substructures if failure would affect downstream values;
  - Removal of all stream culverts;
  - A stable surface that minimizes future erosion; and
  - The establishment of self-sustaining vegetation appropriate for the site.

### **3.6 2017 Exploration Program Specific Considerations**

- The RMA for the fish-bearing Fish Creek is 30 m for drilling and 50 m for exploration access (based on a stream width of >5 and ≤20). The majority of access trails have been routed outside of RMAs and active floodplains to minimize stream crossings. No crossings of the main stem of Fish Creek are currently planned
- The locations of two stream crossings, both non-fish bearing waters, are shown on Figure 1 (numbered blue shaded circles).
- An assessment of stream crossing 1 will be conducted by a qualified professional prior to construction to confirm the stream is non-fish bearing.
- Stream crossings associated with the 2017 NOW will be located and built following guidelines described in this EPMP.

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## **5.0 Appendices**

Figure 1 – Map of Fish Bearing Streams  
New Prosperity Copper-Gold Project

**Figure 1 –  
Map of Fish Bearing Streams  
New Prosperity Gold-Copper Project**

