## Information Request 49



## Response to Information Request 49

**IR 49 – Adaptive management**

**References:**

EIS Guidelines, Section 2.8.3
EIS, Section 2.8.3

**Related Comments:**

CEAR # 290 (Tsilhqot'in National Government)

**Rationale:**

In Section 2.8.3 (p. 65), the EIS Guidelines state that "the EIS shall outline a follow-up and effects monitoring program, designed to verify the accuracy of the conclusions of the environmental assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the Project. The follow-up and effects monitoring program will also support the implementation of adaptive management measures to address previously unanticipated adverse environmental effects."

In the EIS (Section 2.8.3, p. 754), Taseko notes that "adaptive management will be adopted for the Project and is considered a useful and integral component of managing uncertainty while identifying and implementing corrective and mitigation measures." The Panel is of the opinion that an adaptive management approach should include the identification of thresholds and then the implementation of corresponding actions. In order for adaptive management to be an effective tool, thresholds, such as metal concentrations in soil, water seepage rates, etc., should be determined in advance.

The Tsilhqot'in National Government (p.68) considers that "the EIS treatment of adaptive management is theoretical, trivially considered, and simply unacceptable."

This element of the Guidelines is relevant to the assessment of environmental effects of the Project because the Panel is required to determine the significance of effects after mitigation measures are applied. The Panel requires more information on the Proponent's plans for adaptive management to determine the significance of effects after the proposed adaptive mitigation.

**Information Requested:**

With regards to VECs where adaptive management has been proposed, the Panel requests that Taseko:

a. Describe what mitigation measures are feasible and available to Taseko as part of adaptive management processes.

b. Provide example(s) of where these measures have been successful in the past.

**Information Requests #49a and b**

**With regards to VECs where adaptive management has been proposed, the Panel requests that Taseko:**

a. Describe what mitigation measures are feasible and available to Taseko as part of adaptive management processes.

b. Provide example(s) of where these measures have been successful in the past.

**Response Summary**

VEC's where adaptive management has been proposed are listed in the following section. Mitigation measures that have been proposed in the EIS associated with each of these VECS are also included. Further examples of new or enhanced mitigation that are available and could be utilized as part of an adaptive management process are also listed under each VEC.

**Discussion**

**VEC #1) Aquatic Ecology**

**Proposed Mitigation**

Mitigation measures proposed specific to aquatic ecology include but are not limited to:

- Develop and implement a surface sediment and erosion control plan to prevent release of sediments or sediment-laden water;
- Training work crews in the proper installation, use, and maintenance of sediment and erosion control methods;
- To the extent possible, seepage water will be collected and pumped back into the TSF; and,
- Taseko is committed to maintaining baseline water levels throughout the life of mine and beyond. Lake volume will be maintained with the installation of an outlet control structure. Water from the outlet will be recirculated to the inlets to limit the expected change in the hydrologic residence period of the lake.

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available and have been successfully implemented in the locations listed below.**

- Adapt the surface sediment and erosion control plan and enhance the proposed mitigation measures to deal with the release of sediments or sediment-laden water not anticipated in the original plan;
    - Teck Coal Operations in South East BC
    - Highland Valley Copper in Central BC
    - Gibraltar Operations in Central BC
- Installation of further sediment control ponds;
    - Line Creek Coal operations in South East BC
- Application of flocculants within sediment control ponds,
    - Coal Mountain operations in South East BC
- Activated Carbon Filtration / Ultrafiltration to remove suspended solids, colloidal and organic matter — including bacteria and viruses
    - Collahuasi Copper Mine, Northern Chile
- Phosphorus and Nitrogen removal
    - A number of filter, membrane, precipitation, ion exchange and biological assimilation techniques are available
- Constructed wetland treatment
    - Keystone and Rising Star Mines in Shasta County California
    - Tecumseh Abandoned Mine in Warrick County Indiana
- Ozone treatment
    - BMA Saraji Mine, Bowen Basin, Queensland Australia
- Aeration
    - See IR#25f for a list of projects where this technique has been successfully implemented.
- Water treatment options described in more detail under VEC #3.

**VEC #2) Atmospheric Environment**

**Proposed Mitigation**

Mitigation measures proposed specific to the atmospheric environment include but are not limited to:

- Develop and implement an air quality and dust control management plan (AQEMMP);
- Develop and implement a burn plan for vegetative debris consistent with the Open Burning Smoke Control Regulation (BC Reg. 145/93) prior to initiation of the construction and commissioning phase;
- Investigating alternatives to wood waste burning during site and power line clearing programs;
- Implementing waste segregation and recycling programs to reduce the quantity of inorganic wastes incinerated, thereby decreasing CO2 emissions;
- Using BATEA measures and best practices to reduce CAC emissions;
- Meeting or exceeding relevant regulatory emissions standards for all mine equipment;
- Ensuring all mine equipment is properly tuned and maintained;
- Reducing vehicle idling times;
- Avoiding spills during the refueling of vehicles and stationary power equipment to minimize the release of hydrocarbons to the atmosphere;
- Minimizing material transfers by using large haul trucks for ore and waste;
- Covering of trucks used to transport concentrate;
- Installation of dust extraction and ventilation filtration systems within the plant complex;
- Installation of dust collection systems at the primary and secondary crushers;
- Installing covered conveyor belt ore transport systems;
- Implementing effective dust suppression measures such as:
    - Minimize drop heights from conveyors and trucks
    - Vehicle speed regulations to minimize dust
    - Revegetation or covering of exposed areas subject to wind erosion

- Regular application surface-binding chemicals or water on roads and exposed surfaces
- Optimizing blasting practices to reduce noise and dust
- Progressive reclamation of waste rock piles to reduce fugitive dust caused by wind erosion.

Additional mitigation measures for the load-out facility, transmission line and access road are as outlined in the March 2009 EIS/Application.

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available and have been successfully implemented in the locations listed below.**

- Adapt the air quality control plan and enhance the proposed mitigation measures to deal with dust generation not anticipated in the original plan;
  - Coal Mountain operations in South East BC
- Application of magnesium chloride/ calcium chloride, cements or bitumen to the road surfaces;
  - Line Creek Coal operations in South East BC
  - West Shore Terminals, Tsawwassen BC
- Rain guns and water spray towers installed at points of high dust generation;
  - West Shore Terminals, Tsawwassen BC
- Dust shrouds and dust collection systems installed on production drills;
  - Gibraltar Mine, Central BC
  - Greenhills Mine, South East BC
- Install covers over stockpiles;
  - Highland Valley Copper, Central BC
  - Gibraltar Mine, Central BC
- Reduce the number of trucks on the road by increasing truck capacities
  - Common practice used extensively through-out the mining industry

**VEC #3) Water Quality**

**Proposed Mitigation**

Proposed mitigation includes a variety of environmental management and best management plans that are common to many natural resource development projects and as a result have been clearly described and codified. These measures are clearly described in Section 2.8.1. In regard to water quality, some of the plans that will be developed include:

- Vegetation management strategy to minimize the disturbance to riparian habitat;
- Sediment and Erosion Control strategy;
- Air Quality and Dust Control management strategy ;
- Explosive and Blasting management strategy ;
- Instream Work practices and management strategies specific to all instream works;
- Concrete management plans for all works in or close to water (adherence to Code of Practice for Concrete Batch plants if such plants will be used);
- Acid Rock Drainage and Metal Leaching management and monitoring programs;
- Dangerous and hazardous material storage and handling procedures;
- Water Quality, Sediment Quality, and Aquatic Ecology monitoring framework.

In addition to the standard best management practices that will be employed as a part of the New Prosperity Project, several Project-specific strategies will be employed:

- Install an adequate number of contingency seepage collections and pump back wells during the construction period;
- Incorporating primary seepage control measures in the design of the main, south and west embankments of the TSF (e.g., low permeability till core and cut-off keyed into the native till, embankment drains and seepage collection ponds);
- Seepage collection and pump back to TSF and/or OP;
- Multiport water withdrawal for recirculation pump;
- Eutrophication control using hypolimnetic aeration and/or flocculating agents;

- Deposition of tailings so as to create a beach along the TSF embankments that will force the supernatant pond during operations, and the tailings lake during closure and post-closure away from the embankment crest to mitigate seepage through the embankment;
- Partial draining and early reclamation of TSF at the end of ore processing.
- Retain seepage collection ponds and recycle pumps without recirculation to fish habitat until monitoring results indicate that any seepage from the TSF meets acceptable quality objectives for direct release to downstream waters.
- Diverting surface water into the open pit to create a pit lake to restore groundwater elevations to near baseline groundwater conditions in the pit vicinity

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available and have been successfully implemented in the locations listed below. There are numerous water treatment measures readily available commercially. The list below is a small sample of the methods available.**

- Reverse Osmosis Water Treatment Plant;
    - Industry standard water treatment process utilized at numerous locations
    - Cameco's Rabbit Lake Mill Operation in North Saskatchewan
    - Collahuasi Copper Mine, Northern Chile
- Electro-Coagulation Water Treatment Plant (metals removal);
    - City of Taft, California. Public Water Treatment Facility.
    - Kingman Arizona Sewage Treatment Plant
    - Hydro-Met LLC, Deadwood, South Dakota
- Alkali Addition Metal Precipitation Water Treatment Plants,
    - Large-scale technology that offers permanent results. It is applicable for many mine drainage sites and can be used solo or in conjunction with other treatment
    - Glenn Springs Holdings, remediation of Tennessee Copper Basin
    - McCarty Highwall, abandoned surface mine in West Virginia
    - Fire Road Mine in Minto, Sunbury, New Brunswick

- Biological reduction of Selenium;
    - Kennecott Operations in Utah
- Limestone Ponds/Drains: Water flows through ponds or drains lined with limestone to raise the ph and allow metal precipitation.
    - Valzinco Mine, abandoned, underground lead/zinc/copper mine in Spotsylvania County, Virginia
- Bioremediation: This is a method that creates reducing conditions and stimulates bacteria growth in lakes.
    - In use at the Anchor Hill Pit, South Dakota.
- Aeration:
    - Leviathan Mine is an inactive sulfur mine, in Central California, on the border with Nevada
    - See IR#25f for an explanation of this technique and a further list of projects where this technique has been successfully implemented.
- Constructed wetland treatment
    - Keystone and Rising Star Mines in Shasta County California
    - Tecumseh Abandoned Mine in Warrick County Indiana

**VEC #4) Acoustic Environment**

**Proposed Mitigation**

Mitigation measures proposed specific to the acoustic environment include but are not limited to:

- Scheduling construction activities during daytime hours where practical;
- Maintain equipment and provide effective mufflers on equipment;
- Turn equipment off when not in use;
- Maintain project roads to minimize vehicle noise associated with vibration;
- House noise generating equipment inside buildings where practical;
- Enclose conveyors;
- Enforce speed limits.

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available and have been successfully implemented in the locations listed below.**

- Installation of sound barriers;
    - Highway 401, Toronto
    - Highway 1, North Vancouver
- Retrofit custom sound suppression onto mining equipment fleet;
    - TransAlta, Highvale Mine, Wabamun Lake Alberta.

**VEC #5) Fish and Fish Habitat**

**Proposed Mitigation**

Mitigation measures proposed specific to fish and fish habitat, include but are not limited to:

- During the Construction and Commissioning phase, prior to any direct effects or flow reductions, a comprehensive fish salvage plan which incorporates best practices will be implemented;
- Flow augmentation in Fish Creek Reach 8 and Fish Lake Tributary 1;
- Habitat enhancement and barrier removal will occur in Fish Lake tributaries;
- Fish from Fish Lake will be reared in the Hanceville Hatchery and outplanted into lakes in the region.
- Construct Taseko Lake Off-Channel habitat.
- Fish passage restoration and enhancement
- Haines Creek diversion and berm construction
- Elkin Creek diversion upgrade and set-back berm construction
- Riparian reclamation
- Development of access roads and camp sites

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available and have been successfully implemented in the locations listed below.**

- Change the number of outplants as/if required to correspond with habitat capabilities;
- Expansion of the stocking of lakes;
- Construct additional off-channel habitat;
- Enhance and increase the amount of fish passage constructed;
- Increase and enhance access to lakes for fishing and construct more camp sites.

**VEC #6) Sediment and Benthos**

**Proposed Mitigation**

Mitigation measures designed to protect water quality in Fish Lake will also protect sediment quality and aquatic communities, including fish. Mitigation measures to reduce metals generated in TSF water are built into the Project design and include management of acid generating and potentially acid generating waste rock during operations (Section 2.7.2.1). The proposed mitigation measures for sediment and benthos include but are not limited to the following:

- Recirculating water from the Fish Lake outlet back into the lake via Upper Fish Creek and Tributary 1;
- Maintaining stable water levels in Fish Lake;
- Comprehensive erosion and sediment control planning for all phases of the Project to limit the export of sediment to Upper Fish Creek and Fish Lake;
- Limiting sediment inputs to Fish Lake tributaries during construction and operation by following the protocols and recommendations outlined by DFO (1993);
- Dust management planning and control for all phases of the Project;
- Managing expected or potentially acid generating waste rock during operations through seepage collection and pump back to TSF and/or open pit;
- Ongoing re-vegetation of disturbed areas during operations as per the closure and reclamation plan;
- Partially draining and early reclamation of TSF at the end of ore processing and,
- Maintenance of TSF discharge directly to the pit bypassing Fish Lake, and recirculation to fish habitat until such time as TSF water quality meets acceptable quality objectives

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available and have been successfully implemented in the locations listed below.**

- See the additional mitigation methods listed under VEC #1) Aquatic Ecology, #2) Atmospheric Environment and VEC #3) Water Quality all which could be invoked as mitigation against effects on sediment and benthos.

**VEC #7) Soils**

**Proposed Mitigation**

The proposed mitigation measures for soils include but are not limited to the following:

- Implementation of a Sediment and Erosion Control Plan;
- Confinement of vehicle traffic to designated roads and trails;
- Restriction of traffic flow until soils have been salvaged;
- Control strategies for contact water, and non-contact water, for each Project feature including diversion ditch designs and sediment control ponds;
- Salvaging soils within the mine site disturbance area and removing them from Project activities associated with high deposition rates;
- Areas where no salvage is to occur and no proposed mine facilities will be developed, will be avoided;
- Ensuring skilled operators are on the ground that are able to identify topsoil from subsoil;
- Use of an environmental supervisor to oversee soil salvage who will be able to provide guidance of soil salvage efforts and is able to identify conditions that are unsuitable for soil handling (e.g., if conditions are too wet) and stripping depths;
- Restoration of eroded areas;
- During closure, re-establishment of drainages during re-contouring to reduce erosion;
- Use of an environmental supervisor during reclamations to advise crews of suitable conditions for soil replacement;
- For the closure phase when soil in stockpiles is being redistributed, efforts must be taken to ensure the redistributed soil has been contoured properly and no rutting is evident;
- If pooling and rutting are observed prior to seeding, re-contouring or loosening of the soil may be required to allow for proper drainage;
- Prior to topsoil replacement at reclamation rip and loosen of areas where subsoil compaction has occurred, such as roads and trails so that groundwater flow is not impeded;
- Prior to any revegetation efforts, some soil ripping may be required to create a suitable seed bed;

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available and have been successfully implemented in the locations listed below.**

- Application of N, P, K fertilizer may be required after soil replacement to assist in revegetation efforts;
    - Gibraltar Mine, Central BC
    - Samatosum Mine, BC
- The placement of additional suitable soil material over the site to prevent metal uptake from the metal-enriched substrate;
- If the quality of stockpiled soils does not meet requirements for reclamation, additional areas of soil salvage will be identified;
- Adaptation of site preparation and soil placement for reclamation, based on success of reclamation trials;
    - Kemess Mine, BC
    - Gregg River Mine, Alberta
    - Cheviot Mine, Alberta
- Application of additional mitigation measures listed under VEC#2) Atmospheric Environment.

**VEC #8) Terrain**

**Proposed Mitigation**

The proposed mitigation measures for terrain include but are not limited to the following:

- If necessary, complete a detailed on-site terrain stability assessment in any areas identified as potentially unstable with slopes greater than 60% in gradient so that appropriate planning and mitigation measures can be undertaken prior to the commencement of construction activities;
- Minimizing the effect of construction and operations by locating the transmission line and access roads on stable terrain, wherever possible;
- Reducing surface disturbances through Project design such as avoidance of unstable and potentially unstable terrain within the ROW and temporary work space or by reducing slope gradient through grading, or by scaling off overhanging rock, diverting water from the slope face, etc.;
- Installation of groundwater monitoring equipment to identify and measure subsurface water in areas of suspected or known slope instability;
- Protecting the site from failures by diverting the flow away from the Project area using diversion barriers or channels, constructing catchment structures such as basins, or protective structures such as walls and embankments;
- Install signage in construction areas surrounding the pit and pit walls alerting workers of potential areas where slope failure may occur and ensure areas are secured from ground crew access prior to blasting;
- Minimizing work during periods of heavy rainfall or intense snowmelt;
- Minimizing construction activities that undercut or overload dangerous slopes, or that redirect the flow of surface or ground-water;
- Rip-rapping and/or diversion of streams that undercut potentially unstable slopes (note: effects on fish habitat must be considered for any such modification);
- Reducing weight of potential slide mass (cutting off the head of the slide, or totally removing the landslide), flattening the surface slope angle (“laying back” the slope face) through grading, preventing water infiltration by controlling surface drainage, or reducing the accumulation of subsurface water by installing sub-drains;
- Stabilizing, restoring, and re-vegetating banks and slopes to increase stability and minimize the rates of surface water run-off or ground-water infiltration;

- Increasing holding strength of slope by pinning individual blocks, covering the slope with mesh or net, or installing rock anchors or rock bolts on dense spacing;
- Conducting a terrain stability assessment of the pit walls during closure to identify any mitigation or monitoring required to address terrain stability issues that may affect stability of the site, or affect successful reclamation; and
- Shoreline reinforcement at post-closure for the Pit.
- In the event of a failure mitigation may include: replacing slide debris with compacted fill, and draining the slide mass.

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available and have been successfully implemented in the locations listed below.**

- The mitigation measures listed above include measures to prevent, minimize or protect against potential terrain instability. Dependent on each project component and specific circumstances, the mitigation measures applied will vary. In the event that mitigation measures used to limit terrain instability are found to be ineffective, the particular circumstances will be evaluated and additional measures from the list above implemented as appropriate;
- adjustment of the alignment of the access road and transmission line, and final positions of some infrastructures based on information collected terrain assessments and/or monitoring programs, to ensure that Project components are constructed on stable terrain;
- Application of shotcrete to pit walls or other areas having potential or known instability;
    - Shotcrete is commonly used in many projects including stabilization of rock slopes along highways through-out BC;
    - Elkview Coal Mine, South East BC

**VEC #9) Vegetation**

**Proposed Mitigation**

The proposed mitigation measures for vegetation include but are not limited to the following:

- minimizing disturbance, avoiding vegetation loss, and maintaining natural drainage patterns;
- implement an invasive plant management plan (Commitment 12.6). Mitigate against invasive species in the transmission line, access road, and mine site by implementing the Invasive Plant Strategy (Appendix 2.7.2.7-A) as appropriate.
- Mitigation for the [previously] red-listed moss Schistidium heterophyllum includes movement of the boulders on which the moss grows. [Note: this species is now blue-listed as of March 31, 2011.]
- Employ BMP throughout all Project phases and activities. In particular, prior to construction commencing, undertake all appropriate measures to ensure that sensitive habitat features are identified and all appropriate mitigative measures are implemented to avoid adverse effects (Commitment 14.1);
- Identify and quantify Project effects on vegetation at a local level on a scale that enables identification of appropriate mitigation or compensation measures (Commitment 14.4);
- Assess the suitability of reclaimed sites for wildlife use through trace element monitoring in vegetation (Commitment 16.3);
- Incorporating traditional use species into reclamation;
- Developing a compensation plan following the draft Habitat Compensation Framework, and Fish and Fish Habitat Compensation Plans;
- implement habitat compensation plan;
- Mitigation measures to protect and conserve wetlands in close proximity to the mine footprint, including minimizing disturbance, avoiding vegetation loss, mitigating against invasive species, and maintaining natural drainage patterns (Commitment 12.2);
- Mitigate residual effects of mining with respect to wildlife habitat, at-risk plant communities, and the habitat of species at risk through reclamation approach as described in the decommissioning plan (Commitment 13.5);
- Implement best management practices including the creation of buffer zones around wetland habitats, maintaining connectivity among wetlands within wetland complexes,

and restricting employee and contractor access to wetlands outside of construction or work areas;

- Where possible, minimize the extent of grubbing, stripping and the removal of shrubs and herbaceous species, and retain the humus layer and vegetation root mat;
- Re-establish vegetation on disturbed areas as soon as reasonably possible; progressive reclamation activities will be used, when feasible, to revegetate disturbed areas within the mine site to include natural species and country foods;
- Encourage slope stability and minimize soil quality degradation through grass seeding and slope revegetation;
- Ensure water flow around work site is not interrupted;
- Wherever possible, schedule any construction to occur in sensitive wetland and riparian areas to

  occur when potential impacts are minimized; and,
- Remove any green felled or wind thrown spruce from the site as required in consultation with MFLNRO, to avoid buildup of spruce bark beetle populations; leave any mountain pine beetle “green attack” trees from the site except under MOFR direction.

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available and have been successfully implemented in the locations listed below.**

- Based on survival trials, adjust which species are used as part of the reaclamation program;
  - Reclamation trials and success monitoring is common in the industry;
  - Gibraltar Mine, Central BC
  - Kemess Mine, BC
  - Brewery Creek Mine, Yukon
- If it is shown that plants accumulate trace elements to levels where humans, wildlife or livestock may be affected, suitable mitigation measures will be developed. Such measures may include the enhancement of the proposed mitigation measures for dust and soils;

- If re-vegetation success remains low, investigation of soil properties, browse pressure and other factors will be undertaken so that limitations to reclamation success can be identified and removed or mitigated;
    - Gibraltar Mine, Central BC
    - Elkview Coal, South Eastern BC
- Application of additional mitigation measures listed under VEC #2) Atmospheric Environment and VEC #7) Soils

**VEC #10) Wildlife**

**Proposed Mitigation**

The proposed mitigation measures for wildlife include but are not limited to the following:

- Implement habitat compensation plan;
- Develop a Vegetation and Wildlife Management Plan as described in 2.8.1;
- develop a problem wildlife prevention and response plan as part of the Vegetation and Wildlife Management Plan. The plan should include non-lethal deterrent methods if an event develops;
- Wolves will be specifically included in the problem wildlife prevention and response plan and any wildlife awareness training;
- Develop and implement the mitigation measures that fall under the overarching Grizzly Bear Mortality Risk Reduction Plan;
- In addition, the following EMPs (Section 2.8.1) are applicable: Access Management Plan, Air and Noise Management Plan, Water Management Plan;
- Implement sections of the Conceptual Reclamation and Decommissioning Plan that pertain to wildlife habitat;
- Develop procedure for helicopter over-flights to minimize acoustic disturbance during the big horn sheep lambing period;
- provide Bear Aware and Bear Safety information and training for all Project personnel;
- Implementation of a Grizzly Bear education and awareness program will commence at the outset to ensure human-bear interactions are minimized;
- Wildlife protection measures to apply to project personnel travelling to and from Project;
- Wildlife road mortality will be minimized through driver training, road maintenance, radio communication, and employee training;
- Prior to and during site clearing for mine site facilities (e.g., camp, parking lot, processing plant), any wildlife habitat features (e.g., mineral licks, dens, nest trees, snags, rock outcrops, small ponds/seepages) that are identified will be evaluated for potential mitigation measures;

- Prior to construction undertake a survey to identify potential wildlife crossing locations along the TSF access road to evaluate options for road design or additional environmental management plan elements;
- Specific to the construction of the transmission line, procedures developed for bird protection may include:
    - Evaluation and selection of the most appropriate bird markers;
    - Incorporation of trees and shrubs into the route design where feasible, to provide natural obstacles for birds to navigate, directing their flight over lines;
    - Identification of high collision risk areas;
    - Confirmation that conductor/line spacing is large enough to greatly minimize or eliminate electrocution risk; and,
    - Evaluation and selection of perch deterrents (e.g., “bird spikes”) for the poles;
- Consideration of work windows when planning proposed work methods, activities and schedule, in order to protect listed populations and/or species and their habitat;
- Best practice is adherence to region-specific breeding bird timing windows for site clearing and any subsequent vegetation management activities;
- Implement measures governing site clearing procedures;
- site clearing area will be minimized;
- Avoiding site clearing of moderate or higher quality denning habitat in mid-winter unless pre-winter assessment of the area was conducted to determine active dens;
- Restrict project-related activities, which would be related to water management and monitoring, near the inlet to Fish Lake during the spring in order to minimize disturbance to any grizzly bear using this area and to minimize the risk of bear-human encounters;
- Retain actual or potential wildlife trees (i.e., dead or dying trees and snags, and living or dead deciduous trees) wherever possible and safe to do so;
- Evaluate the feasibility of fencing any appropriate mine site water features;
- Work with the Ministry of Environment;
- Mitigation measures for other VECs/KIs are applicable, including: old forest; wetland ecosystems; riparian ecosystems; fish habitat; aquatic ecosystems;

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available.**

- The above proposed mitigation efforts will be increased and/or enhanced
- Implement appropriate addition mitigation measures listed under VEC's # 1) Aquatic Ecology, 2) Atmospheric Environment, 3) Water Quality, 4) Acoustic Environment, 7) Soils and 9) Vegetation;
- If the project related wildlife collision and near miss record indicates a problem, implement a "Grizzly Bear Mortality Investigation Program" under the direction of the BC Ministry of Environment;

**VEC #11) Aboriginal Interests**

**Proposed Mitigation**

The proposed mitigation measures include but are not limited to the following:

- Taseko is committed to communicating with local First Nation communities to discuss aboriginal interests and measures that enhance habitat, improve abundance and diversity of wildlife species that are of interest, and provide or improve access to other areas in the territory for harvesting and gathering of plants.
- Mitigation by design - the New Prosperity mine design preserves Fish Lake, the fishery in the watershed, the ability to navigate in Fish Lake, the island in Fish Lake and 85% of the known archaeological sites;
- Continued access to Fish Lake;
- Implementation of the Fish Compensation Plan to enhance fish and fish habitat, and provide fishing opportunities in the region, to offset the loss of Little Fish Lake;
- Implementation of the Habitat Compensation Plan to offset project impacts to wildlife habitat; and,
- Consideration of species of interest in reclamation planning. Traditional use (berry, medicine and other cultural use) plants that are listed in the final revegetation species list include: dwarf mountain blueberry, wild strawberry, black currant, black gooseberry, red elderberry, common paintbrush, black hawthorn, green alder, and water birch.

Mitigation measures with respect to atmospheric environment, acoustic environment, water quality, fish and fish habitat, vegetation, and wildlife listed in the sections above also apply.

**If the proposed mitigation is shown to be inadequate to achieve the objectives, the following additional mitigation methods are available.**

- Adaptive management measures associated with other VEC's such as atmospheric environment, acoustic environment, water quality, fish and fish habitat, vegetation and wildlife will be implemented. Continued consultation with local First Nation communities is expected to drive initiatives associated with this valued concern.

**VEC #12) Human Health**

**Proposed Mitigation**

Mitigation measures proposed to maintain air quality and limit dust and maintain water quality in the Fish Lake watershed, will provide the necessary protection for human health, terrestrial ecological receptors and for country food quality. No additional mitigative measures specific to the HHERA would be required.

**If the proposed mitigation is shown to be inadequate to achieve the objectives,** adaptive management measures associated with atmospheric environment, soils and water quality will be implemented.

**VEC #13) Physical and Cultural Heritage Resources**

**Proposed Mitigation**

Special monitoring and mitigation measures include avoidance of most sites, clear marking of boundaries around the sites and the development of a Cultural and Heritage Protection Plan which ensures the sites will not be disturbed throughout all phases of the mine development.

Specific mitigation measures will include:

- Prior to work on site, site orientation will be provided to geologists, contractors, engineering field crew, and equipment operators in order that they are aware of all known archaeological and heritage resources;
- An Environmental Monitor will be designated to ensure work does not cause excessive or unneeded disturbance;
- All known sites near planned activities will be flagged with a 30 meter boundary. The three sites in the buffer of the pit area near the outflow of Fish lake will be clearly marked to ensure avoidance during all phases of mining;
- Daily checks when construction is occurring in the area will be performed to ensure that work is not encroaching on the buffer zoned areas;
- Once activities have been completed in the areas of archaeological and heritage resource sites, flagging will be removed so as not to draw attention to the sites.

**No additional mitigation measures are proposed at this time. If additional mitigation is determined to be necessary, additional measures would be developed and implemented in consultation with local First Nations communities.**