7.0 WILDLIFE MITIGATION AND MONITORING

The Project has the potential to affect wildlife through a number of effects mechanisms such as direct and indirect habitat loss, habitat fragmentation/connectivity, and changes in movement patterns, and increased mortality risk. The proposed mitigation measures and wildlife monitoring program described in this section were designed to reduce or minimize the effects of the Project on wildlife and to monitor the effects of the Project to allow for effective adaptive management of mitigation measures over time to ensure that the Project-related effects on wildlife are avoided or minimized.

7.1 Wildlife Mitigation Measures

Benga will be implementing a number of best management practices, Project design features, and other wildlife mitigation measures to avoid or minimize effects on wildlife. These best management practices, design features, and mitigation measures are presented below in relation to each of the expected Project-wildlife interactions that were assessed.

7.1.1 Species at Risk

To prevent or minimize Project effects on federally-listed (SARA) species at risk, Benga will work in consultation with Environment Canada to develop species-specific mitigation and monitoring plans for species at risk known to occur in the WLSA. These species include olive-sided flycatcher, common nighthawk, short-eared owl, and little brown myotis. Critical habitat has not yet been identified for these species by Environment Canada; should this happen, mitigation plans will be updated to include critical habitat. Over the duration of the Project, other species at risk may be found in the WLSA or added to the SARA list of protected species. If this occurs, Benga will contact Environment Canada to determine mitigation requirements for these additional species.

At the time of the updated submission, federal recovery strategies exist for three species at risk in the WLSA – olive-sided flycatcher (Environment Canada, 2016a), common nighthawk (Environment Canada, 2016b), and little brown myotis (proposed) (Environment Canada 2015). The short-term and long-term objectives outlined in these recovery strategies, and any future federal action plans that may be developed from these proposed recovery strategies, will form the basis for Project mitigation and monitoring plans for these three species. Additionally, a proposed federal management plan for short-eared owl was also released (Environment Canada, 2016c). Should recovery strategies, action plans, or management plans be developed by Environment Canada for any other species at risk found in the WLSA, the Project mitigation and monitoring plans will be adapted accordingly.

7.1.2 Migratory Birds

Mitigation measures to prevent or minimize Project effects on migratory birds and their habitats are incorporated into Section 7.1.3 (habitat availability), Section 7.1.4 (habitat connectivity and movement),

and Section 7.1.5 (mortality risk). Key measures include planning vegetation clearing outside of the breeding bird period (April 15 to August 31) characteristic of the region, conducting pre-disturbance nest searches, and implementing an effective conservation and reclamation plan (Section F - C&R Plan) that promotes the development of habitats required for migratory birds. Benga also acknowledges that Environment Canada encourages industry to develop Beneficial Management Practices guides to minimize potential Project-specific impacts on migratory birds and their habitat.

7.1.3 Habitat Availability

The majority of Project-related wildlife habitat loss will result from land clearing, surface mining, and construction of infrastructure and roads. In addition to direct physical loss of habitat, indirect habitat loss may arise from sensory disturbances (*e.g.* artificial light and increased noise from equipment and blasting, and vehicles) that cause wildlife species to avoid the area and from dust accumulation on vegetation and in wetlands.

Many of the Project effects associated with wildlife habitat loss will be minimized through implementation of the Project's reclamation plan. The summary of the reclamation plan mitigation recommendations for wildlife and wildlife habitat reclamation include:

- minimize the overall disturbance footprint through the mine planning process to avoid critical breeding habitats, nesting and denning sites, and movement corridors to the extent possible;
- preserve remnant forest patches within the development areas where feasible to provide habitat, habitat connectivity and hide cover for wildlife species;
- remnant patches should protect known essential raptor habitat features by incorporating these habitat features (*i.e.* mature balsam poplar and aspen) where possible;
- maximize the direct placement of salvaged soil to enhance native plant development;
- retain slash and large woody debris in the salvaged soil to provide microsites for native plant and hide cover for wildlife;
- establish a variety of vegetation species and communities suitable for wildlife, and encourage structural complexity within the forests;
- encourage understory complexity in reclaimed forests by planting native shrubs such as alder and willow;
- ensure that core security areas are provided for wildlife;
- provide water management program that ensures the surface water quality is maintained; and
- limit sight lines by maintaining mature forest stands as buffers between roads and reclamation areas.

To support the reclamation plan mitigation measures, the following will be implemented to mitigate potential direct and indirect Project effects on wildlife habitat availability:

- Incorporate the existing legacy mining disturbances into the development and reclamation plans for the project, and other proposed land use activities to the best extent possible so that habitat loss, habitat fragmentation, linear disturbance features, and cumulative habitat loss are minimized.
- Pre-disturbance surveys (wildlife sweeps) will be conducted in the development area prior to any construction activities during Project development to determine the occurrence of any important wildlife habitat features such as migratory bird nests, mineral licks, active dens, bat habitat and hibernacula, active raptor nest sites, and essential raptor habitat features (*i.e.* mature balsam poplar, platform/stick nests) that could indicate the presence of species at risk.
- Protect all important wildlife habitat features in areas of suitable wildlife habitat (on the edge of the Project footprint boundary) appropriate setback distances (or buffer zones) will be considered.
- Clearing and equipment use/storage/cleaning in undisturbed areas within and adjacent to the Project footprint will be avoided.
- Vegetation adjacent to high-activity linear corridors (*e.g.* access roads, coal conveyor) will be retained to reduce the extent of noise and visual sensory disturbances to the extent possible.
- The overland coal conveyor system was designed in such a manner to prevent any deposition of coal product along the route from the CHPP to the rail load-out area (Section C.3). This includes a cover for the length of the conveyor to reduce dust, and motor specifications to reduce industrial noise levels.
- Where appropriate, vegetated buffer zones (100 m or minimum of 30 m; pending topography constraints) will be maintained between Project infrastructure and wetlands, creeks, and streams to the best extent possible.
- As required by the *Weed Control Act* and Regulations, all identified noxious and invasive weed species populations will be controlled prior to any site disturbance and mine operation to prevent the further spread of weeds. Noxious weed management will occur in compliance with R&R/03-4 *Weeds on Industrial Development Sites* (Alberta Environment, 2003b).
- As the presence of artificial lighting can potentially affect bird and bat use of nearby habitats, Benga has developed a visual impact mitigation plan that reduces stray and non-essential artificial lighting to minimize wildlife effects and that will comply with OH&S safety requirements (CR #1 – Air Quality).

- To mitigate the potential effects of sensory disturbance (acoustic and visual) on effective habitat availability in the southeast portion of the Gold Creek valley, Benga will install and maintain a 15-m tall earth berm along the eastern edge of the south disposal area (CR #2 – Noise Impact Assessment). The earth berm will be constructed/maintained during the day-time when required and will grow in elevation as the height of the disposal area increases.
- Sensory disturbance from the active mine site will be further mitigated through the use of mufflers on all internal combustion engines, utilizing mine pit topography to shield noise generated from haul trucks, and conducting blasting during daylight hours (CR #2 – Noise Impact Assessment).

7.1.4 Habitat Connectivity and Movement

Habitat loss and fragmentation reduce habitat connectivity and thereby can affect daily and seasonal movements and dispersal of wildlife species. Wildlife may move into or through habitats that are physically disturbed but are unlikely to reside there, and they are also prone to sensory disturbances (acoustic or visual). As identified in the Project Assessment Case (Section 5), the potential barriers to wildlife movement associated with the Project include:

- loss of vegetation and landscape alteration from construction of surface mine, infrastructure and roads;
- vehicular traffic activity associated with the mine access road and other mining activities;
- coal conveyor infrastructure; and
- the railway loop.

The reclamation plan outlines mitigation measures that will be implemented during progressive reclamation (*i.e.* reclamation that will occur over the life of the mine operations and into closure) that will minimize the impact of the Project on wildlife movement.

The following general wildlife mitigation measures will be implemented to minimize potential disruption to daily and seasonal wildlife movements:

- A minimum of six wildlife crossings (underpasses and overpasses) will be incorporated into the design of the coal conveyor (the conveyor route is approximately 5.4 km in length) (Figure 7.1-1):
  - will be strategically placed in locations that will maximize wildlife use (*e.g.* presence of well used trails, suitable habitats, and terrain features such as valleys and depressions that act as natural crossings);

  - additional pre-disturbance surveys will be conducted to identify important wildlife habitats and trails along the access road and conveyor corridor;
  - natural underpasses using topography are preferred; and
  - above-ground crossings may be required when topography isn't favourable, conveyor will likely be raised higher above the ground to allow wildlife movement under it.
- Surface water management ponds and ditches located in undisturbed areas of the Project footprint will be designed to allow wildlife to move around or cross safely.
- Road plowing and grading will be conducted in a manner that does not restrict wildlife from crossing access roads or accessing wildlife crossings.
- Measures to control dust and other air emissions (*e.g.* watering of roads and use of dust suppressants, minimizing engine idling, *etc.*) within the Project footprint will be implemented to minimize effects on adjacent wildlife habitats (CR #1 – Air Quality).

Project-specific mitigations targeted to carnivore species have been incorporated into the reclamation planning. Many of these will also support habitat connectivity for migratory birds, raptors, and species at risk, and include:

- minimize the overall disturbance footprint through the mine planning process;
- preserve remnant forest patches in the development areas to provide essential habitat, habitat connectivity, and hide cover for wildlife species;
- retain slash and large woody debris in the replaced soil landscape;
- plant native shrubs early in the reclamation process to initiate hiding cover;
- establish mixed wood forest stands and high density coniferous tree stands;
- provide understory complexity in the reclaimed forests by planting native shrubs such as alder and willow to provide security cover for the carnivores and their prey;
- maximize the amount of ungulate habitat;
- prior to final reclamation, disrupt linear disturbances and sight lines by mounding surface soils, piling brush; and
- limit sight lines by maintaining mature forest stands or by planting high density coniferous stands to act as buffers between roads, project disturbance boundaries and the reclaimed mine areas.

Additional mitigations that are specifically targeted to grizzly bears and grizzly bear habitat will also support other carnivores and migratory birds, and include:

- maintain a 100 m undisturbed forested buffer around Blairmore Creek and other riparian corridors;
- leave patches of residual forest within and adjacent to the mine footprint; and
- commence reclamation early on in mine operations by seeding reclaimable areas with plant species favourable to grizzly bear forage, and by planting shrub and tree species that provide suitable cover (*e.g.* willow, alder, coniferous trees).

For migratory birds, additional relevant mitigations include:

- retain slash and large woody debris in the salvaged soil to provide microsites for native plant and hide cover and perches for wildlife; and
- ensure reclaimed areas promote the re-establishment of woody species and are on a trajectory for reforestation.

For raptors, additional relevant mitigations include:

- retain residual patches of essential habitat and habitat features within and adjacent to the mine footprint (*i.e.* mature poplar trees, tall conifer trees) to provide perches, nest sites, and hide cover;
- minimize loss of mature and old-growth forest habitat and avoid complex, multi-story mixedwood forest where possible; and
- maintain a 100 m buffer of undisturbed forest around Blairmore Creek, Gold Creek and other riparian corridors.

Targeted mitigation measures involving amphibians and amphibian habitat include:

- conduct monitoring to identify other habitable ponds and to identify habitat requirements and constraints;
- construct trial breeding ponds;
- reclaim upland habitat adjacent to reconstructed breeding ponds; and
- avoid habitat destruction and alteration outside of the defined Project footprint to the best extent possible.

Mitigation measures specific to bat species include:

- avoid direct and indirect impacts to known, primary maternity roosts should any such roosts be located/identified;

- prior to removal or alteration of historic mine shafts and infrastructure, conduct roost and hibernacula surveys within them, and consult with AEP should hibernacula or roosts be located; and
- where possible, tree clearing will be planned to avoid the May to August bat summer season.

7.1.5 Mortality Risk

Wildlife mortality risk may increase as a result of increased traffic, wildlife encountering equipment, or elements of the Project footprint, and wildlife being attracted to Project facilities or humans. The Grassy Mountain area currently has a considerable network of trails and roads that are heavily used. Plans are already being implemented to reduce this level of access and with the approval of this Project, the levels will be reduced considerably more. Mitigation measures that will be implemented to reduce wildlife mortality risk include:

- All access to the Mine Permit will be controlled, no uncontrolled access will be permitted. Common operational practices will include:
  - prohibiting use of snowmobiles and ATVs;
  - prohibiting hunting, harassment, or feeding of wildlife; and
  - implementing a strictly enforced zero tolerance policy on the use of firearms.
- Timing vegetation site clearing activities to occur outside the April 15 to August 31 period to avoid disrupting nesting migratory and resident songbirds and raptors:
  - In the event that vegetation clearing must occur within the restricted activity period, pre-disturbance nesting surveys will be conducted by experienced avian biologists according to established sensitive species inventory guidelines (GoA, 2013b). Establish species-appropriate setback distances around confirmed active nest sites until fledging in consultation with Environment Canada and AEP. If the status of a nest cannot be confirmed, or if a nest is found outside of the breeding season, a setback distance will be implemented until such time as the nest status can be confirmed (GoA, 2013b).
- Confirm the presence/absence of bats in high quality habitats located within the Project footprint prior to the initiation of any clearing activities and develop a mitigation plan if bats are found.
- Conducting pre-disturbance denning (bears, marten, *etc*.) and roosting (bats) surveys prior to vegetation clearing and other high-disturbance activities. Consult with AEP as needed to develop appropriate mitigation and management strategies.
- Conducting pre-disturbance surveys (acoustic surveys and visual searches) to identify wetlands and watercourses used by breeding Columbia spotted frogs and western toads that feed into the protection plans.

- Benga commits to supporting active bear management plans associated with the Project. If a site specific plan is required, it will be developed in consultation with AEP personnel as part of the Wildlife Mitigation and Monitoring Plan. The plan is expected to be a comprehensive document that outlines operational strategies and best practices for addressing concerns related to not only bear-human conflicts but potential risks to ungulates and other wildlife resulting from attraction of bears to the area.
- Developing a Beneficial Management Plan guide to minimize potential Project-specific impacts on migratory birds and their habitat by identifying more site-specific mitigation and monitoring measures following Project approval and in consultation with federal and provincial regulators.
- A detailed Waste Management Plan will be developed and implemented prior to construction and operational activities to minimize the attraction of wildlife. Benga will follow the Best Management Practices for camps, fences, and barriers as described in Bear Smart: Best Management Practices for Camps (ASRD 2011), and ensure all waste is stored in wildlife-proof containers and disposed of properly. Some of the waste management and bear awareness/Bear Smart guidelines that will be implemented include:
  - ensuring food waste, refuse, and other attractants are securely contained in enclosed and approved bear-proof containers and/or facilities (*e.g.* hard-sided buildings, fenced compounds, and bear-proof transfer station) prior to transportation to a disposal facility to prevent access by scavenging bears;
  - providing adequate signage to inform employees of the location and proper use of bear-proof storage containers/facilities;
  - ensuring waste storage containers/facilities are not filled beyond capacity;
  - ensuring regular inspection and maintenance of waste storage containers/facilities is carried out;
  - ensuring measures contained in the bear management plan are diligently followed by all employees and contractors;
  - all on-site staff will receive Bear Awareness Training; and
  - bear warning signs will be installed to advise staff of locations where problem bears have been reported.
- Implementing an Emergency Spill Response Plan to limit the effect of accidental spills. Spills will be minimized by restricting fuel storage and filling to designated areas that are at least 100 m from wetlands and watercourses as well as Project drainage ditches, sediment control ponds, and pit lakes.

- Storing all hazardous materials, including those used for blasting, in secure areas that are inaccessible to wildlife (*e.g.* buildings, storage areas surrounded by wildlife-proof fencing). In addition, proper handling and storage of industrial materials and debris within the Project footprint will be maintained to minimize potential risks to wildlife.
- Developing procedures to clear blasting areas of large mammals or birds prior to blasting.
- Designing water management ponds and drainage ditches, and pit lakes to minimize potential entrapment of wildlife.
- Developing a strategy to minimize changes in water quality upstream of the mine in conjunction with a water-quality monitoring program.
- Enforcing speed limits (≤50 km/hr) along the main access road and utility corridors, and placing signs at identified wildlife crossings to increase driver diligence to minimize wildlife-vehicle collisions. Vehicles will yield to all wildlife crossing the main access road.
- Bird collisions with buildings will be mitigated by placing visual markers on windows, and collisions with the proposed power line will be mitigated by installing large 'floats' or other markers.

7.2 Preliminary Wildlife Monitoring Program

Wildlife monitoring will be used to monitor the effects of the Project on wildlife species at risk or species of management concern during construction and operation of the Project and post-closure. In particular, the effects of the Project on wildlife VCs, including disturbance, mortality, and movement will be monitored. Monitoring will consist of a systematic monitoring program along with incidental observations. The wildlife monitoring program will serve a number of important functions including:

- verifying impact predictions and monitoring the effectiveness of mitigation measures;
- improving Benga's understanding of the effects of Project construction and operation on wildlife within the WLSA and surrounding area to enable the implementation of adaptive management practices when required; and
- ensuring compliance with the terms and conditions of the Operating Approval and Project environmental standards once the Project has been approved by AER and CEAA.

As part of the wildlife monitoring program for the Project, Benga will engage regulators (both provincial and federal), First Nations, and traditional land users in discussion regarding approaches to further minimize effects on species of special interest. Such approaches might include continued monitoring, habitat management, and participation in regional initiatives (*e.g.* the ABMI program to assist with monitoring regional cumulative effects on biological resources).

Important considerations in selecting monitoring procedures include minimizing observer influence and ensuring that monitoring activities do not create added disturbance to sensitive wildlife species. In addition, it is important that monitoring efforts are focussed on parameters that are directly related to effects mitigation and that provide opportunities to improve mitigation performance over time. For these reasons, the wildlife monitoring program will initially focus on the following, but will not be limited to:

- Continuing with and expanding the use of wildlife camera monitoring as a low-disturbance, passive monitoring approach to quantitatively measure changes in use of preferred habitat types by larger species such as grizzly bear, moose, and elk and elusive species of concern such as marten, lynx, and wolverine in the vicinity of the Project footprint.
- Monitoring breeding birds, raptors, waterbirds, bats, and amphibians using sensitive species inventory guidelines (GoA 2013b) and recommendations from federal recovery strategies (olive-sided flycatcher, common nighthawk, and little brown myotis) as reclamation progresses over the landscape:
  - targeted species will include, but not be limited to:
    - SARA schedule 1 species known to occur in the WLSA: olive-sided flycatcher, common nighthawk, short-eared owl, and little brown myotis;
    - COSEWIC-listed species known to occur in the WLSA: western toad, barn swallow;
    - provincially listed or protected species; and
    - species of traditional use or value.
- Implement a wildlife sighting program for Project personnel and contractors to document wildlife occurrences within the Project footprint during the construction and operations to document wildlife movements. This information can be used for monitoring wildlife use/crossings of access roads to identify major wildlife crossing areas for signage placement, improve employee/contractor wildlife awareness, and assist with monitoring the effectiveness of mitigation measures (*i.e.* avoiding wildlife-vehicle collisions).
- Construction monitoring to ensure timing windows, setbacks, and other mitigation measures are followed.
- Monitoring wildlife use of Project-related linear features (*e.g.* railway loop, transmission line, pipelines, drainage ditches, and ponds) during operation.
- Monitoring wildlife crossings to determine the efficiency of the structures at maintaining wildlife movements
- Monitoring the effectiveness of any access control measures (*e.g.* gates) on roads and other linear features.

- Monitoring and documenting all human-wildlife interactions that occur within the Project footprint.
- Post-closure wildlife monitoring linked with the reclamation monitoring program and any other related environmental monitoring programs, continuing until all permit conditions are satisfied and the AER releases the Project site.

This initial wildlife monitoring approach will enable Benga to evaluate the effectiveness of their wildlife protection, mitigation, and reclamation procedures and to ensure that the Project does not adversely affect wildlife in the region. A detailed wildlife mitigation and monitoring plan based on provincial and federal Approval Conditions will be developed following Project approval.