

Reasons why the council should **NOT** issue an order in lieu of consent:

***(C) That the use does not substantially prohibit the operations of the surface owner.***

Reasons why an order in lieu of consent for the proposed mining and reclamation would substantially prohibit the operations of the surface owner:

Grazing

The proposed mining will cause a substantial loss of grazing revenue over the course of 25+ years (mining and reclamation) as approximately 1,210 acres identified in the grazing lease (Appendix A) will be without livestock water due to BPM mining of two reservoirs.

These lands exceed the maximum cattle travel distance to water in this type of terrain – 0.5 mile and in some cases almost three times the maximum distance (Agrilife Extension, 2014). This will eliminate these lands from the lease and reduce the initial annual grazing revenue by \$13,068 ( $\$30.00/\text{AUM} \times \$0.36 \text{ AUM}/\text{ac} \times 1,210 \text{ ac}$ ).

An additional reservoir that previously supplied water to these lands does not hold water even after being repaired due to expansion of the bentonite haul road.

BPM’s lack of a definitive mining and reclamation schedule prevents the determination of the exact number of years of decreased grazing revenues, but grazing lease AUM’s will annually rise 6.14% in conjunction with the increase in agricultural lands and pasture lands/ac (Appendix A - Wyoming Board of Land Commissioners Land Exchange)

Based on the proposed 25+ years of mining-reclamation and annual AUM increase (6.14%), the proposed mining could potentially result in the following grazing lease losses:

<u>YEAR 1</u>	<u>GRAZING LEASE LOST REVENUE (\$)</u>
1	13,068
2	27,740.75
3	43,314.41
4	59,844.29
5	77,389.10
6	96,011.17

7	115,776.63
8	136,755.69
9	159,022.86
10	182,657.24
11	207,742.77
12	234,368.55
13	262,629.16
14	292,624.96
15	324,462.51
16	358,254.89
17	394,122.11
18	432,191.58
19	472,598.52
20	515,486.45
21	561,007.69
22	609,323.94
23	660,606.80
24	715,038.43
25	772,812.17

Additional reduction in grazing lease AUM's (loss of revenue) would be due to remaining reservoirs not having the water capacity to support AUM's, reduced plant palatability due to dust, and animal stress (noise and traffic).

Hunting

The proposed mining will harm our current hunting operation (mule deer and white tail deer) through reduced wildlife habitat and game disturbance (dust, noise, heavy traffic).

Mining will also prevent expansion of hunting operations as planned hunting of elk, pronghorn and turkeys is not viable with the reduced wildlife habitat and game disturbance (dust, noise, heavy traffic).

In addition, planned lodge and cabins for hunting and tourist rentals will not be possible as no one will want to stay in lodging next to a mining operation.

Trees

Loss of 10,936.55 trees (7,928.99 ponderosa pines, 2,460.72 bur oak, and 546.82 junipers) due to mining would irreversibly damage recreation, hunting-tourism, wildlife habitat (wetlands-springs), view-scape (the surrounding terrain) and livestock shelter.

### Recreation and tourism

The proposed mining will cause irreversible damage to recreational opportunities for family members and tourists through destruction of the ecosystem (trees, wildlife habitat, wetlands-springs, view-scape (the surrounding terrain). People will not want to pursue recreational opportunities when mining results in an ugly view-scape, reduces wildlife viewing, and creates an unpleasant environment (dust, noise, heavy traffic).

### Land values

The proposed mining will severely devalue the land resulting in lower values if sold or reduced collateral for a loan.

***(D) The proposed plan reclaims the surface to its approved future use, in segments if circumstances permit, as soon as feasibly possible.***

An order for in lieu of consent should not be issued as the proposed plan **DOES NOT** reclaim the surface to its **APPROVED FUTURE USE**.

The **APPROVED FUTURE USE OF THE SURFACE** is defined by W.S. 35—11-402 (a) (i), Establishment of Standards which states that reclamation should be to the “highest previous use of the affected lands, the **SURROUNDING TERRAIN** and **NATURAL VEGETATION, SURFACE AND SUBSURFACE FLOWING OR STATIONARY WATER BODIES, WILDLIFE AND AQUATIC HABITAT AND RESOURCES**, and acceptable uses after reclamation including the utility and capacity of the reclaimed lands to support such uses”, **NOT JUST GRAZING USE**.

BPM’s claims that the DEQ will decide if the reclamation plan will restore mined lands to their “Highest Previous Use” through the technical review process. DEQ cannot make this determination if the reclamation plan does not include information on all previous uses. Only grazing use is included in the reclamation plan. There is no information on reclamation of trees, recreational lands-hunting, wildlife habitat (wetlands-springs), and view-scape (the surrounding terrain). Therefore, the proposed plan **DOES NOT** reclaim the surface to its approved future use!

The reclamation plan must include information pertaining to restoration of the surrounding terrain and natural vegetation, surface and subsurface flowing or stationary water bodies, wildlife and aquatic habitat and resources. This is **MANDATED BY LAW** or suggested by the following statutes, DEQ rules and regulations, Wyoming environmental quality act, EQC rulings, permit 267C reclamation plan, BPM wildlife plan, DEQ standard operating procedures, DEQ standards, DEQ guidelines, and U.S. Fish and Wildlife Service:

- 1) W.S. 35—11-402 (a) (i), Establishment of Standards which states that reclamation should be to the “highest previous use of the affected lands, the surrounding terrain and natural vegetation, surface and subsurface flowing or stationary water bodies, wildlife and aquatic habitat and resources, and acceptable uses after reclamation including the utility and capacity of the reclaimed lands to support such uses”.
- 2) LQD Non coal rules and regulations, chapter 3, section 2 (a) (i) which states “reclamation shall restore the land to a condition equal to or greater than the highest previous use. The land, after reclamation, must be suitable for the previous use which was of the greatest economic or social value to the community area, or must have a use which is of more economic or social value than all of the other previous uses “.
- 3) Wyoming Environmental Quality Act (EQA) and its implementing regulations. The land must be reclaimed to its highest previous use as mandated by the “CONCLUSIONS OF LAW” in LeFavre vs. EQC 1987 (Appendix A).
- 4) W.S. 35-11-402 (a) which states reclamation must include: (iv) Revegetation of affected lands including species to be used, methods of planting and other details necessary to assure the development of a vegetative cover consistent with the surrounding terrain and the highest prior use standards set out in paragraph (i) of this subsection.
- 5) The reclamation plan does not include specific reclamation plan text which details tree replanting methods and locations as required by Permit 267C Reclamation Plan Section 2.11.8.6 Post-mining Tree Restoration. This is required when the surface owner specifically requests restoration in writing. 2U requested that trees to be replanted in a certified letter to BPM (see Appendix A).

- 6) The reclamation plan does not include tree planting migration as required in the BPM's wildlife plan and by request of the Wyoming Game and Fish Department (see Appendix A).
- 7) The reclamation plan does not include tree restoration as was required in *Klover vs EQC* (Appendix A). In addition, reestablishment of animal habitat which would include replacement of trees destroyed or displaced by mining operations is required as was ordered in *Klover vs EQC* (Appendix A).
- 8) The reclamation plan does not include tree replanting as required by DEQ, Non Coal, Standard Operating Procedure, (SOP) No. 7.4, Land Quality Division, SUBJECT: Bond Release Procedures for Bentonite Mines, Category 4: Lands Disturbed Post August 1981. Lands affected on after September 1, 1981. Reclamation goals on these lands are outlined in WDEQ/LQD Chapter 3, Section 2 (d). Bond release on Category 4 lands is evaluated through an application and a field inspection that addresses the following criteria: (h) If the approved Reclamation Plan includes a specific commitment(s) (i.e. trees, stockpond, etc.), the commitment(s) must be fulfilled.)
- 9) The reclamation plan does not address DEQ – Non Coal, Chapter 3 Non Coal Mine Environmental Protection Performance Standards, Revegetation states “reforestation shall be deemed to be complete when a reasonable population density as established in the reclamation plan has been achieved, the trees have shown themselves capable of continued growth for a minimum period of five years following planting, and the understory vegetation is adequate to control erosion and is appropriate for the land-use goal”. “The plan shall include the method and schedule of revegetation, including but not limited to species of plants, seeding rates, seeding techniques, mulching requirements or other erosion control techniques, and seeding times to be used in a given area for reclamation purposes”.
- 10) The reclamation plan does not address DEQ Guideline No. 2 Vegetation Requirements for Exploration By Dozing, Regular Mines, and In Situ Leaching Ch. 2, Sect. 2(G) states that the reclamation plan should address the following Fish and Wildlife Habitat items:
  - Areal distribution of shrubs and trees on the post mining landscape.
  - Species occurring and estimated density of each.

- Methods used to establish shrubs and trees.
  - Assessment of the quantitative and qualitative aspects of the post mining shrub and tree communities in terms of providing wildlife habitat.
- 11) The reclamation plan does not include wildlife reclamation as required by LQD Non coal rules and regulations, chapter 3, section 2 (a) (ii) Operators are required to restore wildlife habitat, whenever the Administrator determines that this restoration is possible, on affected land in a manner commensurate with or superior to habitat conditions which existed before the land became affected, unless the land is private and the proposed use is for a residential or agricultural purpose which may preclude its use as wildlife habitat.
- The reclamation plan does not include wetlands migration as required by Water Quality, Rules and Regulations, Wyoming Surface Water Quality Standards, Chapter 1, Section 12.
- 12) The reclamation plan does not address mitigating unavoidable impacts to wetland and riparian areas and does not include mitigation goals and objectives, methodologies, time frames for implementation, success criteria, and monitoring to determine if the mitigation is successful. The mitigation plan also does not include a contingency plan to be implemented should the mitigation not be successful. This was requested by the United States Fish and Wildlife Service (see Appendix A).
- 13) BPM is required by Wyoming state statutes, rules and regulations, Environmental Quality, Dept. of Water Quality, Chapter 1: Wyoming Surface Water Quality Standards Rules & Regulations Section 12, Protection of Wetlands to submit a wetlands mitigation plan (see Springs and Wetlands).
- 14) The reclamation plan does not address that springs with a good deal of geologic deposition cannot be mined as the stratigraphy within the spring or immediately adjacent to the spring could yield a valuable climatological, wildlife and human occupation sequence (LeFaivre vs. EQC 1987, Appendix A).
- 15) The reclamation plan does not include the required LQD Non coal Rules and Regulations Chapter 3, Section 2(b) (ii) (A) that states “Individual slope measurements, locations of the measurements, and the average

measurement shall be submitted with the reclamation plan”. This information is necessary to determine if the land is able to be reclaimed to its previous highest use.

An order for in lieu of consent should not be issued as the proposed plan **WILL NEVER** reclaim the surface to its approved future use - **HIGHEST PREVIOUS USE** as **REQUIRED BY LAW** (see statutes, etc. above) , therefore it is **NOT FEASIBLY POSSIBLE** to **EVER** reclaim the mined lands as shown below:

BPM’s claims that it is not the responsibility of the **EQC**, but the **DEQ** (technical review process) to decide if the reclamation plan will restore mined lands to their “Highest Previous Use”. This **NOT TRUE** as the **EQC** has ruled previously that they have the **JURISDICTION** to determine if land can be reclaimed to its highest previous use (LeFaivre vs. EQC 1987, Appendix A). In addition, the **EQC** has ruled that the applicant bears the burden of proving that their application is complete and that it meets all legal requirements (LeFaivre vs. EQC 1987, Appendix A), which BPM has **NOT** been able to prove as this land **CANNOT** be reclaimed to its highest previous use.

**BPM** is on record (certified letter June 29.2018 – Appendix A) stating that they **WILL NOT** and Wyoming law **DOES NOT** require them to replace the mined trees with similar trees. **WRONG** – the Wyoming law requires that the land be reclaimed to its highest previous use. Trees must be restored and seedlings-saplings would not result in the land being restored to its highest previous use. In addition, trees cannot be restored in bentonite reclaimed areas – they do not grow.

- 1) Trees cannot be restored on bentonite reclaimed areas even under the best conditions such as in a greenhouse with supplemental water and soil treatments (see Bentonite Mining Tree Revegetation). BPM’s mining will remove 10,936.55 trees (7,928.99 ponderosa pines, 2,460.72 bur oak, and 546.82 junipers).
- 2) BPM own Section 2.5.4.15 Wyoming State Lease 42804 Amendment Overburden Data shows that the ponderosa pines, bur oaks or rocky mountain junipers cannot be restored due to the poor soil quality overburden that will be used to reclaim the mining disturbances (see Bentonite Mining Tree Revegetation).

- 3) Section 2.7.3.45 Wyoming State Lease 42804 (WSL04) Amendment Soils Report Map Unit 8a; Wetland Soils; 0"/0"; 4.1 sampled acres/1 affected acre. Sampled profile: SL-2 states: "strong acid conditions extend to the surface and there is no suitable soil available for salvage". If there is not any suitable soil available for reclamation, the wetlands cannot be restored. Non-wetlands soil is not a substitute for wetlands soil to restore wetlands to their highest previous use.
- 4) Wildlife require multi-aged ponderosa pines, bur oaks and junipers for habitat (see Tree Wildlife Habitat). The existing trees are multi-aged and sizes with an average tree circumference (cm) ranging from 149.4 with an average of 48.01. Seedlings and saplings will not restore the land back to its previous highest use.
- 5) BPM's own Wildlife Report lists 86 species that are potentially at risk due to the proposed mining (see BPM Wildlife Report).
- 6) Tree removal will reduce recreational and scenic values (see Recreational and scenic values).
- 7) It is not feasible to reclaim the surface to its approved future use due to the number of years it takes for ponderosa pines, bur oaks and junipers to reach maturity and provide optimum habitat (see Tree Species).
- 8) Springs and wetlands are necessary for wildlife and cannot be reclaimed when the average depth of BPM mining is 38 ft with a maximum depth of 69 ft (see Springs and Wetlands).
- 9) BPM's reclamation plan will not restore the disturbed mining lands to their approved future use as soon as feasibly possible as required by W. S. 35 11 406, Application for Permit; Generally; Denial; Limitations, (D) which states that "the proposed plan reclaims the surface to its approved future use, in segments if circumstances permit, as soon as feasibly possible" because the mining schedule is unknown, therefore the reclamation schedule is unknown.



- 10) The reclamation plan does not address DEQ, Land quality – Non Coal, Ch 2: Regular Non Coal Mine Permit Applications, Sec 2 (b) (ii) states that “A time schedule for each major step in the reclamation which coordinates the operator’s reclamation plan with the mining plan in such a manner so as to facilitate reclamation at the earliest possible time consistent with Chapter 3, Section 2(k) and the orderly development of the mining property.” Section 2.11.3.3 Reclamation Progression Maps and Schedules states: “reclamation backfilling in a specific cut will begin within (3) years from the date of the cut was initiated and permanent seeding will be completed no later than five (5) years from the date the cut was initiated. Once again, if the start of mining is unknown then the schedule of reclamation is unknown.
  
- 11) How can reclamation return the surface to its approved future use as soon as feasibly possible when it is not known when the mining will occur? This needs to be multiplied by four as this is the number of pits to be mined.

## Literature Review

### 2U Ranch LLC land damages due to mining

The proposed mining will have negative impacts on recreational use, hunting, wildlife habitat (wetlands-springs), view-scape (the surrounding terrain) as well as grazing.

Section 2.8.8.45 Wyoming State Lease 42804 (WSL04) Amendment Vegetation Report (see Appendix A).

Table 3-1. Approximate acreages and percentages for the vegetation community types on the WY State Lease 42804 Amendment Area.

Disturbance area (acres)

Woodland Habitat = 86.23

Bottomland Meadow Habitat (wetlands) = 0.23

Open Water/Marsh Habitat (wetlands) = 0.20

Total disturbance [recreational use, hunting, wildlife habitat (wetlands-springs), view-scape (the surrounding terrain) as well as grazing = 177

Table 3-3. Tree density in the woodland community type.

Density (per acre)

Pine 91.95

Oak 28.53

Juniper 6.34

All Species 126.

Ponderosa pine is the dominant tree species within the woodland habitat, as shown in Table 3-3. Ponderosa pine comprises 72.5% of the trees sample with bur oak comprising 22.5% and Rocky Mountain juniper comprising 5% of the trees. Overall density of trees within the habitat type was 126.83 trees per acre.

Tree circumference (cm) ranged from 149.4 with an average of 48.01. This indicates that the woodlands consists of trees of different sizes and ages.

10,936.55 trees (7,928.99 ponderosa pines, 2,460.72 bur oak, and 546.82 junipers) will be destroyed by the proposed mining.

## Recreational and scenic values

- The unusual opportunities for outdoor recreation in Wyoming give forests special value. Any damage to the quality of the forest environment may adversely affect recreational values (Wyoming Forest Study Team, 1971).
- It is clear that the protection of trees, water, soils, and wildlife will enhance recreational values. Of more direct concern, however, is the scenic quality of the landscape as seen from roads and trails and even from the air (Wyoming Forest Study Team, 1971).
- The importance of wildlife, recreation, and scenic quality as key values should be recognized in every management decision on the forests of Wyoming (Wyoming Forest Study Team, 1971)
- Forests and wooded areas provide great opportunity for recreational use. Woods enrich scenic values and have a rich botanic interest (NPS, 2018)
- The presence of some forest growth is almost as basic, and as widely recognized, an element in selection of land for recreational use as topographic variety, water, and favorable climate (NPS, 2018).

## Bentonite Mining Tree Revegetation

- Section 2.5.4.15 Wyoming State Lease 42804 Amendment Overburden Data states “The laboratory overburden analysis for Wyoming State Lease 42804 indicate **unsuitably acidic overburden** in each of the tiers of sampling except for S1A 0-5' and 20-25' and S2A tier 25-30'. Therefore BPM proposes to utilize overburden material (tier's 20-30') for reclamation (see Appendix A).
- These trees grow best in 6.0 to 7.0 soil pH (NRCS, 2011) and the problem is the proposed tier's 20-30' for reclamation will still require at least 20' of overburden soil that is unsuitably acidic and will not allow tree growth (see Appendix A - overburden).
- In addition, these trees will not grow in soils with a high silt and/or clay content (NRCS, 2011; Shepperd and Battaglia, 2002). Tier's 20-30' overburden soil is almost entirely composed of silt and clay [93% (51% silt and 42% clay) and 84% (32% silt and 52% clay)], respectively. The remaining overburden is extremely high in silt and clay and will not support trees (see Appendix A - overburden).
- Mature ponderosa pines can have a taproot up to 36 feet which is necessary as an anchor to prevent uprooting (Ponderosa Pine, 2019a). Mature ponderosa pines seldom grow roots past 3 ft in heavy clay soils and would not be able to

support their height or survive high winds without being uprooted during reclamation (Ponderosa Pine, 2019b).

- Revegetation of bentonite mine spoil in arid and semiarid regions of the northern Great Plains, is extremely difficult because when wet, the bentonite spoil swells, and infiltration, permeability, and aeration approach zero. Excessive salt concentrations increase the osmotic potential of the spoil solution to a level that can be toxic to plants. (Bjugstad, 1979).
- Bentonite inhibits plant growth principally by limiting water availability to plants found in the northwestern and northeastern flanks of the Bearlodge Mountains (Wyoming Black Hills) in Crook County, Wyoming (Almas, 1986).
- Ponderosa pine survival on bentonite spoils in northeastern Wyoming is less than seven percent (Bjugstad, 1978).
- Rocky Mountain juniper is poorly adapted to bentonite spoil and has low survival in amended bentonite spoils even under greenhouse conditions (Uresk and Yamamoto, 1986).
- Zero survival of Rocky Mountain juniper transplanted in bentonite mine spoil treatments after four growing seasons at Upton, Wyoming (Uresk and Yamamoto, 1994).
- Rocky Mountain juniper survival on bentonite spoils in northeastern Wyoming is only 24 percent (Bjugstad, 1978).

### **Tree Species**

The Black Hills region has been described as an island of trees in a sea of grass (Ball, 2012).

#### Ponderosa Pine

- Ponderosa pine is a large tree that lives 300 to 600 years (NRCS, 2018).
- Ponderosa pine age at maturity ranges from 70 to 250 years (NRCS, 2002).
- Deer and elk do feed on the understory species of ponderosa pine. The seeds of ponderosa pine are choice food of for many birds, turkeys, chipmunks and squirrels. The pine needles are important food for grouse. The pine bark is fair food for beavers, and is used by porcupines (NRCS, 2002)

#### Bur oak

- Bur oak is a species characteristic of the eastern deciduous forest that reach the western limit of their distribution in western South Dakota and eastern Wyoming. Low precipitation, severe winters, and recurring droughts in this region restrict the growth of bur oak and associated species to areas of increased elevation or to ravines and floodplains where additional moisture allows their existence (Sieg, 1991)
- Bur Oak woodlands are in jeopardy in the northern high plains (Boldt and others, 1978), as evidenced by limited tree and shrub reproduction, decadence, and dominance by invader species.
- Bur oaks are slow-growing, but long-lived and may reach ages of 300 to 400 years old with some trees to 450 (NRCS, 2018).
- For bur oaks the minimum acorn-bearing age is 35, with optimum acorn production occurring between 75–150 years, and trees are known to produce acorns up to 400 years (NRCS, 2018).
- Bur oak acorns are eaten by many birds and mammals, including squirrels, rabbits, ground squirrels, mice, deer, and wild turkey. Bur oak is browsed by deer, elk, and cattle (Fowells, 1965; Johnson, 1990; Gucker, 2011).

#### Rocky Mountain juniper

- Rocky Mountain juniper is a long-lived species that often survives to be 250-300 years old or more (Scher, 2002).
- Rocky Mountain juniper may begin bearing seeds at 10-20 years of age, but the optimum age for seed production is 50-200 years (Scher, 2002).
- Rocky Mountain juniper seeds are rated good in energy value and fair in protein value and is an important food source for elk, mule deer, white-tailed deer, small mammals, small nongame birds, and upland game birds (Scher, 2002).
- Rocky Mountain juniper provides hiding/escape cover, thermal cover and fawning cover for elk, mule deer, white-tailed deer, small mammals, small nongame birds, and upland game birds (Scher, 2002).

#### Tree Wildlife habitat

“In Black Hills, nearly all wildlife use ponderosa at some point in the year” stated Todd Caltrider a Wyoming Game and Fish Department habitat biologist (Wyoming Wildlife, 2018).

#### White-Tailed Deer

- The white-tailed deer population within the Black Hills is on the decline. In Crook County, white-tailed deer herds are estimated to be decreasing at a rate of 10 to 15 percent annually (DePerno, 1998; DePerno and others, 2000).
- Black Hills white tail consume ponderosa pine needles, bur oak twigs-acorns, and common juniper (Hill 1946; Hippensteel, 2000; Schenck and others, 1972; Schneeweis and others, 1972; Sieg and Severson, 1996).
- White-tailed deer utilize a variety of habitat types including different structural stages of ponderosa pines, bur oaks and junipers (DePerno, 1998; Kennedy, 1992; Stefanich, 1995; Uresk and others, 1999).

#### Mule deer

- Although habitat requirement studies of mule deer are limited for the Black Hills (Wydeven and Dahlgren, 1985), some general conclusions can be made based on other geographical studies. Mule deer abundance is highest in shrubby/brushy land, riparian woodland, and at the edge of forest and meadow areas where shrubs are found (Natural Resource Conservation Service, 2000).
- In the Missouri River Breaks study area in Montana, mule deer were found in ponderosa pine-Rocky Mountain juniper habitat types throughout the year (Mackie, 1970).
- In the Badlands National Park in South Dakota, chokecherry habitat and Rocky Mountain juniper habitat types were used (Steigers, 1981).
- Shrubs and trees make up the majority of mule deer diets throughout the year, especially in the fall and winter (Kufeld and others, 1973).
- Use of irregularly spaced, uneven-aged or multi-aged management can maintain and enhance ponderosa pine forests for mule deer habitat. (Shepperd and Battaglia, 2002).

#### Elk

- Black Hills elk consume and utilize for habitat ponderosa pine forests (Bauman 1998; Millspaugh, 1995).
- Black Hills elk select ponderosa pine forests with canopy closures more than 54 percent, increased basal area, and more trees per acre (Millspaugh and others, 1998).

- Elk habitat selection is influenced by several human-caused disturbances such as roads used by motorized vehicles (Millspaugh, 1995; Rowland and others 2000; Rumble and others 2002; Ward and Cupal, 1979).
- The spatial arrangement of forage and cover habitats is an important component to consider in elk management. Calving habitat typically occurs in openings less than 1 acre (0.4 ha) in size, with no overstory more than 5 feet (1.5 m) tall and ground cover with herbaceous vegetation, shrubs, and some coarse woody debris. These openings typically have at least one side adjacent to dense ponderosa pine stands with high canopy coverage (Rice, 1988).
- Providing adequate food sources while maintaining cover, through a mixture of open meadows and closed dense forests, will help maintain elk populations in the Black Hills (Shepperd and Battaglia, 2002).
- Use of irregularly spaced, uneven-aged or multi-aged management can maintain and enhance ponderosa pine forests for elk habitat (Shepperd and Battaglia, 2002).

## Turkeys

- Successful turkey nests are generally found on slopes 30 to 40 percent regardless of aspect in moderately open ponderosa pine forests with average basal area of 85 ft<sup>2</sup> per acre (19.4 m<sup>2</sup> per hectare) and 451 trees per acre (1,116 trees per hectare) (Rumble and Hodorff, 1993).
- Turkeys show preference for nesting in areas that have not been cut or recently thinned (precommercial and commercial) within the past 2 years (Shepperd and Battaglia, 2002).
- Seed-tree cuts are infrequently used and clearcuts are never utilized for nesting habitat (Shepperd and Battaglia, 2002).
- Nest overstory coverage is often greater than 77 percent and often consists of shrubs such as common juniper (Rumble and Hodorff, 1993).
- From late spring to summer, turkeys forage in ponderosa pine habitats (Rumble and Anderson, 1996b).
- In early fall of years of good bur oak mast production, turkeys can be found in bur oak habitats as well as open ponderosa pine habitats (Rumble and Anderson, 1993b).
- By October turkeys move to dense ponderosa pine habitats with overstory canopy cover greater than 71 percent and basal areas greater than 140 ft<sup>2</sup> per acre (32 m<sup>2</sup> per hectare) (Shepperd and Battaglia, 2002).

- From October to April, ponderosa pine seed and bearberry seeds, which can be found in great abundance under dense ponderosa pine habitats, make up the majority of a turkey's diet (Rumble and Anderson, 1993b, 1996b) (Shepperd and Battaglia, 2002).
- Roosting trees provide perches and a resting place for turkeys, and are an important habitat component for sustaining turkey populations (Hoffman and others, 1993; Rumble, 1992).
- In the Black Hills, turkeys select roost sites that have trees with large d.b.h., low tree density, and high basal area (Rumble, 1992). Roost trees averaged 13.8 inches (35 cm) d.b.h., but trees 9 inches (23 cm) d.b.h. or greater were used. Average basal area of roost sites ranged from 82.8 ft<sup>2</sup> per acre to 109 ft<sup>2</sup> per acre (19 to 25 m<sup>2</sup> per hectare). Trees with layered horizontal branches spaced at 2- to 3- foot intervals that allow easy access for turkeys were characteristic of roost trees (Hoffman and others, 1993).
- The key to providing Merriam's turkey habitat is to have a diversity of structural and stocking conditions within the Black Hills ponderosa pine landscape (Shepperd and Battaglia, 2002).
- Merriam's turkeys utilize different structural habitats for nesting, brood rearing, roosting, and foraging. Broods are reared in open meadows adjacent to dense ponderosa pine forests (Shepperd and Battaglia, 2002).
- Nesting habitat is found in open stands, with an understory component that provides cover (Shepperd and Battaglia, 2002).
- Summer habitats are found in open ponderosa pine and aspen stands with low canopy coverage (Shepperd and Battaglia, 2002).

#### Northern Goshawk

- Goshawk nest sites in the Black Hills have been found in mature ponderosa pine, white spruce, or near stands of maturing aspen, but only mature ponderosa pine were actually selected as nest trees (Bartelt, 1977; Erickson, 1987). Tree sizes at nest sites ranged from 8 to 20 inches (20 to 51 cm) d.b.h. with a mean of 16 inches (41 cm) (Bartelt, 1977; Erickson, 1987). Nest trees ranged from 12 to 23 inches (31 to 58 cm) and were usually the largest trees in the stand (Erickson 1987). Nest site locations contained over 120 ft<sup>2</sup> per acre (27.5m<sup>2</sup> per hectare) basal area with average canopy closure of 70 percent.
- Nest abandonment seems to increase with an increasing amount of disturbance, and the probability of nest abandonment is greatest just before, during, or just after incubation (Bartelt, 1977).



#### Dark-eyed Junco

- Found in all structural stages of ponderosa pine and aspen/paper birch forests throughout the year, but abundance is highest in open-canopied forests of ponderosa pine and aspen (Dykstra and others, 1999; Mills, 1994; Mills and others, 1996, 2000; Rumble and others, 2001).

#### Ovenbird

- Found mostly in aspen/paper birch habitats and in ponderosa pine stands with deciduous components (Dykstra and others, 1999; Mills, 1994; Mills and others, 2000; Rumble and others, 2000b, 2001).

#### Townsend's Solitaire

- Utilize the sapling-pole, mature, and multistoried/old growth structural stages of ponderosa pine forests (Mills and others 1996; Rumble and others 1999).

#### Gray Jay

- Utilize the sapling-pole, mature and multistoried/old growth structural stages of ponderosa pine forests (Mills and others 1996; Rumble and others 1999).

#### Yellow-rumped Warbler

- One of the most common species within all ponderosa pine structural stages (Dykstra and others, 1999; Mills 1994; Mills and others, 2000).

#### Western Tanager

- Most common in mature and multistoried/old growth ponderosa pine forests (Mills and others, 2000).

#### Chipping Sparrow

- Live in both ponderosa pine and aspen/paperbirch habitats (Rumble and others 2001). Abundance is highest in sapling-pole and mature ponderosa pine stands and aspen/paper birch habitats (Mills and others, 2000).

### Pine Siskin

- Inhabit ponderosa pine and mixed ponderosa/aspen forests in the Black Hills (Rumble and others, 2001).

### Red Crossbill

- Is a short-distance migrant that breeds in the Black Hills during the winter (late December to March) (South 64 USDA Forest Service General Technical Report RMRS-GTR-97, 2002; Dakota Ornithologists' Union, 1991). The red crossbill relies heavily on ponderosa pine seed for its food. Although ponderosa pine forests with 71 to 100 percent canopy coverage have greater seed production than less dense forests (Rumble and Anderson, 1996b).

### Swainson's Thrush

- Found in both ponderosa pine and aspen/paper birch habitats of the Black Hills (Mills and others, 2000; Rumble and others, 2001). Abundance is limited to mature and multistoried/old-growth ponderosa pine stands and sapling-pole aspen/paper birch stands (Dykstra and others, 1999; Mills and others, 2000).

### Ruby-crowned Kinglet

- Optimal habitat for the ruby-crowned kinglet in the Black Hills occurs in mature and old-growth ponderosa pine structural stages. Sapling-pole and ponderosa pine structural stages were found to be unsuitable habitat (Mills and others, 1996).

### American Robin

- Live in both ponderosa pine and aspen/paper birch habitats in the Black Hills (Mills and others, 2000; Rumble and others, 2001). Sapling-pole and aspen, sapling-pole ponderosa pine, and mature ponderosa pine stands are used frequently (Dykstra and others, 1999; Mills and others, 2000).

### Warbling Vireo

- Inhabits all structural stages of ponderosa pine (Mills and others, 1996; Rumble and others, 2001).

### Brown Creeper

- Classified as a sensitive species by the U.S. Forest Service Rocky Mountain Region (USDA Forest Service, 2002b). Brown creepers select stands that are dense and have large-diameter trees (Dykstra and others, 1999; Mills and others, 2000; Rumble and others, 1999, 2000). Even in stands within the same size category, brown creepers will choose stands with higher densities of large diameter (greater than 15 inches; >38 cm) ponderosa pine (Rumble and others, 2000). In the northern Black Hills, brown creepers occur in high abundance in multistoried/old growth ponderosa pine stands (Dykstra and others, 1999).

### Mountain Bluebird

- Optimal habitat is found in open habitats such as sapling-pole and mature ponderosa pine stands (Mills and others, 1996, 2000).

### Black-capped Chickadee

- Is abundant in all structural stages of both the ponderosa pine and aspen/paper birch habitats, but is most abundant in multistoried/ old growth ponderosa pine and sapling-pole aspen/paper birch habitats (Mills and others, 1996, 2000).

### Northern Flicker

- Utilize both ponderosa pine and aspen/paper birch habitats in the Black Hills (Mills and others, 2000; Rumble and others, 2001). Northern flickers are most abundant in the shrub-seedling and sapling-pole aspen stands and in open mature ponderosa pine stands (Mills and others, 2000).

### Lewis' Woodpecker

- Is listed as a sensitive species by the U.S. Forest Service Rocky Mountain Region (USDA Forest Service 2002c). Open mature and multistoried/old growth

ponderosa pine forests and burned, partially logged forests are valuable nesting habitat (Saab and Dudley, 1998; Tobalske, 1997; USDA Forest Service, 2000).

#### Black-backed Woodpecker

- Is classified as a sensitive species by the U.S. Forest Service Rocky Mountain Region (USDA Forest Service, 2002d). In the Black Hills, the black-backed woodpecker is observed in sapling-pole, mature and multistoried/old growth ponderosa pine stands (Dykstra and others, 1999; USDA Forest Service, 2000).

#### Downy Woodpecker

- Abundance of the downy woodpecker throughout the year is similar across structural stages and canopy coverage of both ponderosa pine and aspen stands (Mills and others, 2000; Rumble and others, 1999, 2001).

#### Three-toed Woodpecker

- Is classified as a sensitive species by the U.S. Forest Service Rocky Mountain Region (USDA Forest Service, 2002e). The three-toed woodpecker chooses mature and multistoried/old growth ponderosa pine and white spruce stands (USDA Forest Service, 2000).

#### Hairy Woodpecker

- Utilize both ponderosa pine and aspen/paper birch habitats in the Black Hills throughout the year (Mills and others, 1996, 2000; Rumble and others, 1999, 2001). Hairy woodpecker abundance is generally highest in the open to moderate canopy coverage stands of sapling-pole and mature stands of ponderosa pine. In addition, abundance is high in multistoried/old growth ponderosa pine (Dykstra and others, 1999; Mills and others, 1996, 2000).

#### Red-naped Sapsucker

- Utilizes ponderosa pine forests (Dykstra and others, 1999; Mills and others, 2000; Rumble and others, 2001).

### Red-breasted Nuthatch

- Found at higher elevations during summer and in lower elevation ponderosa pine and deciduous forests during winter (Haldeman, 1980; South Dakota Ornithologists' Union, 1991). USDA Forest Service General Technical Report RMRS-GTR-97, 2002). Throughout the year, red-breasted nuthatches are most abundant in mature and multistoried/old growth ponderosa pine stands (Crompton, 1994; Dykstra and others, 1999; Mills, 1994; Mills and others, 2000; Rumble and others, 1999). Red-breasted nuthatches are also found in sapling pole ponderosa pine stands with the highest abundance in areas with high canopy coverage (Mills, 1994; Mills and others, 2000).

### White-breasted Nuthatch

- Abundance during the summer is greatest in sapling pole and mature ponderosa pine stands (Dykstra and others, 1999; Mills, 1994; Mills and others, 1996, 2000). In winter, multistoried/old growth and ponderosa pine stands with more than 70 percent canopy coverage provide moderate quality habitat. Open bur oak habitats provide the best habitat for white-breasted nuthatches during the winter (Rumble and others, 1999).

### Pygmy Nuthatch

- Classified by the Rocky Mountain Region of the Forest Service as a sensitive species (USDA Forest Service, 1996c). The pygmy nuthatch is associated with mature and old growth ponderosa pine forests with canopy coverage less than 70 percent (Clark and others, 1989).

### Brown-headed Cowbird

- Abundance is similar among all structural stages of ponderosa pine and aspen, as well as all the canopy coverage categories (Dykstra and others, 1999; Mills and others, 2000; Rumble and others, 2001).

### Bird Management guidelines

- Managers concerned with sustaining and increasing Black Hills bird diversity should start by maintaining within- and between-stand structural diversity to

provide for habitat needs of birds during both the breeding season and the winter (DellaSalla and others, 1996; Huff and others, 1991; Mills and others, 2000).

- Ponderosa pine forests that have deciduous components such as bur oak or aspen can provide more habitats for some wildlife species than are typically found in a monotypic coniferous stand (Dykstra, 1996; Glenn-Lewin, 1977; Mills and others, 2000; Rumble and others, 2001).

**BPM Wildlife Report (see Appendix A)**

**4.1 Threatened and Endangered Species**

**4.1.3 Northern Long-Eared Bat**

These bats were listed as Threatened in April 2015. These bats roost predominantly in trees and, to a lesser extent, in man-made structures (USFWS, 2013). Other factors impacting the species are loss of forest habitat through development and timber management, mine-land reclamation that closes hibernacula.

Woodland habitat makes up more than half of the amendment area. There is the potential for northern long-eared bats in the area and roosting under bark or within tree crevices.

**4.3 Migratory Birds of Concern**

The USFES IPAC identified 12 migratory bird species potentially occurring in the amendment area that are identified as Natural Resources of Concern. The species and their preferred habitat are listed in Table 4-1. Also listed is the potential for the species to occur on the amendment area based on suitable habitat.

**4.4 Big Game**

Four big game species occur in the amendment area: elk (*Cervlls canadensis*), pronghorn antelope (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), and white-tailed deer (*Odocoilells virginianus*).

**Table 4-1 Migratory Birds of Concern potentially within the amendment area.**

	Scientific Name	Preferred Habitat	Potential on Site
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Bald eagle	<i>Haliaeetus leucocephalus</i>	Near lakes, reservoirs, rivers, marshes and coasts.	Possible
Cassin's finch	<i>Carpodacus cassinii</i>	Open coniferous forest.	Possible
Dickcissel	<i>Spiza americana</i>	Grassland with dense, moderate to tall vegetation and moderately deep litter.	Possible
Ferruginous hawk	<i>Buteo regalis</i>	Open country; nests in tall trees, on cliff ledges, river-cut banks, hillsides.	Possible
Golden eagle	<i>Aquila achrysaetos</i>	Inhabits open and semi-open country; nests on rock ledges of cliffs or in larger trees.	Possible
Grasshopper sparrow	<i>Ammodramus svannarum</i>	Grassland of intermediate height.	Possible
Lewis's woodpecker	<i>Melanerpes lewis</i>	Open forest and woodland.	Possible
Loggerhead shrike	<i>Lanius ludovicianus</i>	Open country with scattered trees and shrubs.	Possible
Long-billed curlew	<i>Numenius americanus</i>	Breeds on prairies and grassy meadows near water.	Possible
Short-eared owl	<i>Asio flammeus</i>	Generally nests on high ground or upland sites; forage and nests on open land with low vegetation.	Possible
Swainson's hawk	<i>Buteo swainsoni</i>	Nests in trees; forages on open terrain with scattered trees.	Possible
Upland sandpiper	<i>Bartramia longicauda</i>	Short grassland habitat; nests on ground among grasses.	Possible

#### 4.3.1 Bald Eagle

Bald eagles preferentially roost in conifers or other sheltered sites in winter in some areas and they typically select larger, more accessible trees (Buehler et al, 1991, 1992).

#### **4.3.2 Cassin's Finch**

The Cassin's finch inhabits coniferous and mixed forests that are usually somewhat open. They are known to occur in all the mountain ranges of Wyoming with the exception of the Black Hills (Dorn and Dorn, 1990). Since the amendment area is within the Black Hills region of Wyoming.

#### **4.3.3 Dickcissel**

Suitable habitat is present on the amendment area and there is the potential for this species within the site or in the vicinity (NatureServe, 2014).

#### **4.3.4 Ferruginous Hawk**

This species prefers unbroken, semiarid grassland with elevated nesting sites such as trees, rock outcrops, hills and ridgelines (Johnsgard, 1990). Suitable nesting habitat, in the form of trees, is common on the amendment area and there is the potential for this species to both nest and forage in the area. Should an active raptor nest become established prior to the initiation of mining activities, construction should be avoided within 1.0 mile of any active ferruginous hawk nest during the nesting season.

#### **4.3.5 Golden Eagle**

Golden eagles typically nest on the rock ledges of cliffs but they also nest occasionally in large trees (NatureServe, 2014). Due to the prevalence of woodland habitat on the amendment area, there is the potential for this species to nest in the area. There is the potential for golden eagles to nest in the vicinity. Should an active raptor nest become established prior to the initiation of mining activities, construction should be avoided within 0.5 mile of any active golden eagle nest during the nesting season.

#### **4.3.6 Grasshopper sparrow**

These sparrows prefer grasslands of intermediate height and are often associated with clumped vegetation interspersed with patches of bare ground (Bent, 1968, Blankespoor, 1980; Vickery, 1996). Other habitat requirements include moderately deep litter and



sparse coverage of woody vegetation (Smith, 1968, Bent, 1968). Suitable habitat is present on the amendment area and there is the potential for this bird on the site.

#### **4.3.7 Lewis's Woodpecker**

This woodpecker breeds in open forest and woodland that have often been logged or burned, including oak, coniferous forest (primarily ponderosa pine), riparian woodland and orchards (AOU, 1983). Suitable habitat is present on the site and in the vicinity.

#### **4.3.8 Loggerhead Shrike**

This species prefers relatively open country with scattered trees and shrubs, savanna, desert scrub (southwestern U.S.). (AOU, 1983). Loggerhead shrikes nest in shrubs or small trees (deciduous or coniferous) (Bent, 1950; Brooks, 1988). Suitable habitat is present on the site and in the vicinity.

#### **4.3.9 Long-billed Curlew**

This shorebird breeds on prairies and grassy meadows, generally near water and it nests in dry prairies and moist meadows (AOU, 1983). Grassland structure is an important component of long-billed curlew habitat. Preference for areas in which vegetation density is concentrated near ground level may be important in terms of the feeding behavior of long-billed curlews or their ability to see potential predators. Suitable habitat is present on the amendment area and in the vicinity.

#### **4.3.10 Short-eared Owl**

The short-eared owl ranges over mid and tall grasses and marshes, often hunting during daylight (Sibley, 2000). Suitable habitat is present on the amendment area and in the vicinity. Should an active nest become established prior to the initiation of mining activities, construction should be avoided within 0.25 mile of any active short-eared owl nest during the nesting season.

#### **4.3.11 Swainson's Hawk**

Swainson's hawks inhabit open country such as grassland, shrubland, and agriculture areas (NatureServe, 2014). These raptors nest in trees, usually those bordering agricultural fields, in wetland borders, and on abandoned farms. Due to the prevalence

of woodland habitat on the amendment area, there is the potential for this species to nest in the area. Should an active nest become established prior to the initiation of mining activities, construction should be avoided within 0.25 mile of any active nest during the nesting season.

#### 4.3.12 Upland Sandpiper

The upland sandpiper prefers meadows and hay fields (Dorn and Dorn, 1990). Since mixed grass prairie is common on the site and in the vicinity, there is the potential for this species on the amendment area.

**Table 4-2 Additional mammal species potentially occurring within the WSL04 amendment**

<b>Common Name</b>	<b>Scientific Name</b>
Long-legged myotis	<i>Alyotis Volans interior</i>
Big brown bat	<i>Eptesicus fuscus</i>
Townsend’s big-eared bat	<i>Plecotus townsendii pallescens</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Hoary bat	<i>Lasiurus cinereus</i>
Long-eared myotis	<i>Myotis evotis</i>
Northern grasshopper mouse	<i>Onychomys leucogaster</i>
White-footed mouse	<i>Eronmyscus leucopus</i>
Deer mouse	<i>Peromyscus maniculatus</i>
Western harvest mouse	<i>Reithrodontomys megalotis</i>
Thirteen-lined ground squirrel	<i>Spermophilus tridecemlineatus</i>
Least chipmunk	<i>Tamias minimus</i>
Plains pocket gopher	<i>Geomys bursarius</i>
Northern Pocket gopher	<i>Thomomys talpoides</i>
Hispid pocket mouse	<i>Chaetodipus hispidus</i>
Olive-backed pocket mouse	<i>Perognathus fasciatus</i>
Prairie vole	<i>Microtus ochrogaster</i>
Meadow vole	<i>Microsus pennsylvanicus</i>
Longed-tailed vole	<i>Microtus longicaudus longicaudus</i>
Bushy-tailed woodrat	<i>Neopoma cinerea</i>
White-tailed jackrabbit	<i>Lepus townsendii</i>
Desert Cottontail	<i>Sylvilagus audubonii</i>
Porcupine	<i>Erethizon dorsatum</i>

Long-tailed weasel	<i>Mustela frenata</i>
Striped skunk	<i>Mephitis mephitis</i>
Badger	<i>Taxidea taxus</i>
Raccoon	<i>Procyon lotor</i>
Coyote	<i>Canis latrans</i>
Swift fox	<i>Vulpes velox</i>
Red fox	<i>Vulpes vulpess</i>
Bob cat	<i>Lynx rufus</i>
Long-eared bat	<i>Myotis septentrionalis</i>

#### 4-3 Table Upland Games Birds

Common Name	Scientific Name
Wild turkeys	<i>Meleagris gallopavo</i>
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>

#### 4.4 Upland Game Birds

Wild turkeys (*Meleagris gallopavo*) inhabit somewhat open woodlands, especially ponderosa pine or riparian areas (Dorn and Dorn, 1990).

Sharp-tailed grouse (*Tympanuchus phasianellus*) During winter, sharp-tails often rely on riparian areas and other sites that support deciduous trees and shrubs for feeding, and roosting (Parker, 1970).

#### 4-4 Table Raptors

Common Name	Scientific Name
Golden eagles	<i>Aquila achrysaetos</i>
Northern harriers	<i>Circus cyaneus</i>
Turkey vultures	<i>Cynomys ludovicianus</i>
Great horned owls	<i>Bubo virginianus</i>
Red-tailed hawks	<i>Buteo jamaicensis</i>
Swainson's hawks	<i>Buteo swainsoni</i>
American kestrels	<i>Falco sparverius</i>
Ferruginous hawks	<i>Buteo regalis</i>
Prairie falcons	<i>Falco mexicanus</i>
Rough-legged hawks	<i>Buteo lagopus</i>

#### 4.5 Raptors

Three raptors were observed flying over the amendment area during the May and June 2014 surveys: golden eagle (*Aquila achrysaeto*), northern harrier (*Circus cyaneus*), and turkey vulture (*Cynomys ludovicianus*). Vocalizations from a great horned owl (*Bubo virginianus*) were heard at night but no owls were observed. During the January and February 2016 surveys, one golden and one bald eagle were observed flying over and vocalizations from a great horned owl were heard in the evening, but no owls were observed.

Suitable raptor nesting habitat is plentiful on the amendment area in the woodland habitat. Additional raptor species that could utilize the site and vicinity for foraging and nesting include red-tailed hawks (*Buteo jamaicensis*), Swainson's hawks (*Buteo swainsoni*), American kestrels (*Falco sparverius*), ferruginous hawks (*Buteo regalis*), and prairie falcons (*Falco mexicanus*). Rough-legged hawks (*Buteo lagopus*) likely forage in the area during the winter.

Should an active nest become established prior to the initiation of mining activities, construction should be avoided within 0.25 mile of any active raptor nest during the nesting season. The exception is a 1-mile buffer for ferruginous hawks. If an active bald eagle nest is found, the USFWS should be contacted to determine the spatial buffer distance.

#### 4-5 Table Waterfowl and Shorebirds

Common Name	Scientific Name
Mallards	<i>Anas platyrhynchos</i>
Canada geese	<i>Branta Canadensis</i>
Killdeer	<i>Charadrius vociferous</i>
Sandhill crane	<i>Grus Canadensis</i>

#### 4.6 Waterfowl and Shorebirds

There are four reservoirs within the amendment area, as described in Section 3.1.4. Waterfowl were most abundant on the largest reservoir but Mallards (*Anas platyrhynchos*) were observed on the northern and southern ponds as well. Mallards with chicks were observed on the large reservoir, indicating nesting occurred at that body of water. The only other waterfowl observed were Canada geese (*Branta*

*canadensis*) but it is likely a number of other species utilize the ponds either as nesting areas or as temporary resting areas. The only shorebird observed was the killdeer (*Charadrius vociferous*), while sandhill crane (*Grus canadensis*) vocalizations were heard in the early evening.

#### 4.7 Passerine Birds

A number of passerine bird species were observed on the amendment area. Species observed and expected are those typically inhabiting prairie and woodland habitats. There is the potential for mining activities to disturb and destroy active passerine bird nests if construction occurs during the nesting season, typically from May 1 through July 15.

#### 4.8 Other Mammals

Other mammals in the amendment area is the desert cottontail (*Sylvilagus audubonii*), white-tailed jackrabbit (*Lepus townsendii*), red squirrel (*Tamiasciurus hudsonicus*), coyote (*Canis latrans*), and the northern pocket gopher (*Thomomys talpoides*). Based on geography and habitat, these species do potentially occur on the site.

#### 4-6 Table Reptiles and Amphibians

Common Name	Scientific Name
Boreal chorus frogs	<i>Pseudacris maculata</i>
Northern leopard frogs	<i>Lithobates pipiens</i>
Tiger salamanders	<i>Ambystoma myvortium</i>
Short-horned lizard	<i>Phrynosoma douglassi</i>
Plains hognose snake	<i>Heterodon nasicus</i>
Eastern yellowbelly racer	<i>Coluber constrictor</i>
Pale milk snake	<i>Lampropeltis triangulum</i>
Bullsnake	<i>Pituotphis melanoleucas</i>
Wandering garter snake	<i>Thamnophis elegans</i>
Prairie rattlesnake	<i>Crotalus viridis</i>

#### 4.9 Reptiles and Amphibians

Boreal chorus frogs (*Pseudacris maculata*) were present in the reservoirs on the amendment area. It is possible that the northern leopard frog (*Lithobates pipiens*) is also

present in the largest reservoir but, a positive identification was not made. It is also possible that tiger salamanders (*Ambystoma myvortium*) are present, although none were observed.

The only lizard species expected on the amendment area is the short-horned lizard (*Phrynosoma douglassi*). Snake species potentially occurring in the region are the plains hognose snake (*Heterodon nasicus*), eastern yellowbelly racer (*Coluber constrictor*), pale milk snake (*Lampropeltis triangulum*), bullsnake (*Pituotphis melanoleucas*), wandering garter snake (*Thamnophis elegans*), and prairie rattlesnake (*Crotalus viridis*).

### **Spring and Wetlands**

- Wyoming state statutes, rules and regulations, Environmental Quality, Dept. of Water Quality, Chapter 1: Wyoming Surface Water Quality Standards Rules & Regulations

Section 12. Protection of Wetlands. Point or nonpoint sources of pollution shall not cause the destruction, damage, or impairment of naturally occurring wetlands except when mitigated through an authorized wetlands mitigation process. When approving mitigation, the department may consider both the ecological functions and the wetland value of the disturbed wetland.

#### Section 2

(iii)"Ecological function" means the ability of an area to support vegetation and fish and wildlife populations, recharge aquifers, stabilize base flows, attenuate flooding, trap sediment and remove or transform nutrients and other pollutants;

(iv)"Man-made wetlands" means those wetlands that are created intentionally or occur incidental to human activities, and includes any enhancement made to an existing wetland which increases its function or value;

(v)"Mitigation" means all actions to avoid, minimize, restore and compensate for ecological functions or wetland values lost;

(vi)"Natural wetlands" means those wetlands that occur independently of human manipulation of the landscape;

(vii)"Nonpoint source" means any source of pollution other than a point source. For purposes of W.S. 16-1-201 through 16-1-207 only, nonpoint source includes leaking underground storage tanks as defined by W.S. 35-11-1415(a)(ix) and aboveground storage tanks as defined by W.S. 35-11-1415(a)(xi);

(viii)"Point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel or other floating craft, from which pollutants are or may be discharged;

(ix)"Pollution" means contamination or other alteration of the physical, chemical or biological properties of any waters of the state, including change in temperature, taste, color, turbidity or odor of the waters or any discharge of any acid or toxic material, chemical or chemical compound, whether it be liquid, gaseous, solid, radioactive or other substance, including wastes, into any waters of the state which creates a nuisance or renders any waters harmful, detrimental or injurious to public health, safety or welfare, to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial uses, or to livestock, wildlife or aquatic life, or which degrades the water for its intended use, or adversely affects the environment. This term does not mean water, gas or other material which is injected into a well to facilitate production of oil, or gas or water, derived in association with oil or gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the state, and if the state determines that such injection or disposal well will not result in the degradation of ground or surface or water resources;

(xiii)"Wetland value" means those socially significant attributes of wetlands such as uniqueness, heritage, recreation, aesthetics and a variety of economic values.

- The reclamation plan does not address that springs with a good deal of geologic deposition cannot be mined as the stratigraphy within the spring or immediately adjacent to the spring could yield a valuable climatological, wildlife and human occupation sequence (LeFavre vs. EQC 1987, Appendix A).
- Fish and Wildlife Service letter to BPM dated August 13, 2014:

Wetlands or riparian areas may be impacted by the proposed project. Wetlands perform significant ecological functions which include: (1) providing habitat for numerous aquatic and terrestrial wildlife species, (2) aiding in the dispersal of floods, (3) improving water quality through retention and assimilation of pollutants from storm water runoff, and (4) recharging the aquifer. Wetlands also possess aesthetic and recreational values. Wetlands may be destroyed or degraded by the proposed action, those wetlands in the project area should be inventoried and fully described in terms of their functions and values. Acreage of wetlands, by type, should be disclosed and specific actions should be outlined to avoid, minimize, and compensate for all unavoidable wetland impacts.

Riparian or streamside areas are a valuable natural resource and impacts to these areas should be avoided whenever possible. Riparian areas are the single most productive wildlife habitat type in North America. They support a greater variety of wildlife than any other habitat. Riparian vegetation plays an important role in protecting streams, reducing erosion and sedimentation as well as improving water quality, maintaining the water table, controlling flooding, and providing shade and cover. In view of their importance and relative scarcity, impacts to riparian areas should be avoided. Any potential, unavoidable encroachment into these areas should be further avoided and minimized. Unavoidable impacts to streams should be assessed in terms of their functions and values, linear feet and vegetation type lost, potential effects on wildlife, and potential effects on bank stability and water quality. Measures to compensate for unavoidable losses of riparian areas should be developed and implemented as part of the project.

Plans for mitigating unavoidable impacts to wetland and riparian areas should include mitigation goals and objectives, methodologies, time frames for implementation, success criteria, and monitoring to determine if the mitigation is successful. The mitigation plan should also include a contingency plan to be implemented should the mitigation not be successful. In addition, wetland restoration, creation, enhancement, and/or preservation does not compensate for loss of stream habitat; streams and wetlands have different functions and provide different habitat values for fish and wildlife resources.

- The Northeast Wyoming Wetland Complex (NE WY Wetland Complex) borders the Bear Lodge Mountains in extreme northeast Wyoming and is located entirely



within Crook County, Wyoming (Wyoming Bird Habitat Conservation Partnership, 2017)

- The NE WY Wetland Complex covers 31% of Crook County with only 1.2% of the complex being wetlands (Wyoming Bird Habitat Conservation Partnership, 2017).
- Approximately 252 vertebrate species, including 157 bird, 56 mammal, 16 reptile and amphibian, and 23 fish species are known to breed within the exterior boundary of the NE WY Wetland Complex (Wyoming Bird Habitat Conservation Partnership, 2017).
- Forty-five “species of greatest conservation need” use the wetland resources within the NE WY Wetland Complex (WGFD 2017).

<b>Birds</b>	<b>Mammals</b>	<b>Fish</b>	<b>Amphibians</b>	<b>Reptiles</b>	<b>Mollusks</b>
American Bittern	Eastern Red Bat	Brassy Minnow	Great Plains Toad	Black Hills Red-Bellied Snake	Giant Floater
American White Pelican		Fringed Myotis	Finescale Dace	Northern Leopard Frog	Eastern Spiny Softshell
Bald Eagle	Hayden's Shrew	Goldeye	Plains Spadefoot	Plains Gartersnake	
Black Billed Cuckoo	Least Weasel	Flathead Chub	Western Tiger Salamander	Plains Hog-nosed Snake	
Black-crowned Night Heron		Little Brown Myotis	Plains Minnow	Red-sided Gartersnake	
Black Tern	Long-eared Myotis	Western Silvery Minnow		Western Painted Turtle	
Common Loon	Long-legged Myotis				
Common Yellowthroat					
Forster's Tern					
Franklin's Gull					
Great Blue Heron					
MacGillivray's Warbler					
Mountain Plover					
Purple Martin					
Trumpeter Swan					
Virginia Rail					
Western Grebe					
White-faced Ibis					
Willow Flycatcher					
Yellow-billed Cuckoo					

- Northeastern Wyoming bentonite site wetland plants are slow to establish at created wetlands because of the poor soils and a lack of suitable propagules; natural wetlands within this region are almost nonexistent and are mostly limited to seasonal playas and small creeks (McKinstry, 2001).
- BPM average depth of mining is 38 ft with a maximum depth of 69 ft (Tetrault, 2018).

### Livestock

Trees can provide livestock with protection from cold wind and blowing snow in winter, as well as from the hot sun and drying winds of summer (NRCS, 2018).

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