LMS/S16845-Rev 1

Programmatic Biological Assessment of Threatened and Endangered Species for the U.S. Department of Energy Office of Legacy Management Activities at Sites in the Upper Colorado River Basin

September 2019

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Abbreviations

BA	Biological Assessment
DOE	U.S. Department of Energy
ESA	Endangered Species Act
LM	Office of Legacy Management
LTS&M	long-term surveillance and maintenance
T&E	threatened and endangered
USFWS	U.S. Fish and Wildlife Service

1.0 Introduction

This document serves as the biological assessment (BA) for the U.S. Department of Energy (DOE) Office of Legacy Management (LM) routine activities at LM sites within the Upper Colorado River Basin. The routine activities include long-term surveillance and maintenance (LTS&M) activities such as groundwater and surface water monitoring, inspections, operations, and maintenance at several sites and activities related to the operation of the open disposal cell at the Grand Junction, Colorado, Disposal Site.

DOE prepared this BA to comply with Section 7 of the Endangered Species Act of 1973, as amended (Title 16 *United States Code* Section 1536). This BA evaluates whether LM actions are likely to (1) adversely affect threatened and endangered (T&E) species, (2) jeopardize the continued existence of species that are proposed for listing, or (3) result in destruction or adverse modification of designated critical habitat. This BA was primarily prepared to analyze the effects of water depletion from LM sites in the Upper Colorado River Basin. However, effects to all T&E species from all routine activities at these LM sites are also included.

LM sites in the Upper Colorado River Basin (Figure 1) include those in the Colorado, Dolores, Green, Gunnison, San Juan, San Miguel, White, and Yampa River systems. The U.S. Fish and Wildlife Service (USFWS) manages sites within the San Juan River Subbasin separately from other sites in the Upper Colorado River Basin, and in accordance with direction from USFWS, LM's San Juan River sites will be evaluated separately. USFWS has previously consulted on LM activities at the Gunnison, Colorado, Disposal/Processing Site (USFWS 2017a) because that site is within designated critical habitat for the Gunnison sage-grouse. Therefore, the Gunnison sites are not included in this BA except as a contributor to effects from water depletion.

1.1 Summary

USFWS has determined that water depletions greater than 0.1 acre/foot per year within the Upper Colorado River Basin adversely affect endangered fish in the Colorado River. Thus, the four species of endangered Colorado River fish are likely to be adversely affected by water depletion resulting from routine activities at LM sites but not likely to be affected by other site activities. Designated critical habitat for the Colorado Pikeminnow and Razorback Sucker is also likely to be adversely affected by water depletion but not likely to be affected by other site activities.

LM has determined that the western yellow-billed cuckoo (threatened) may be affected but is not likely to be adversely affected by routine activities on and near the LM sites within the Upper Colorado River Basin. Designated critical habitat for the western yellow-billed cuckoo is present on or near several LM sites, but it is not likely to be affected by site activities. Colorado Hookless Cactus and Ute Ladies'-Tresses may be affected but are not likely to be adversely affected by routine activities.

Cumulative effects from LM activities are not likely to be significant.

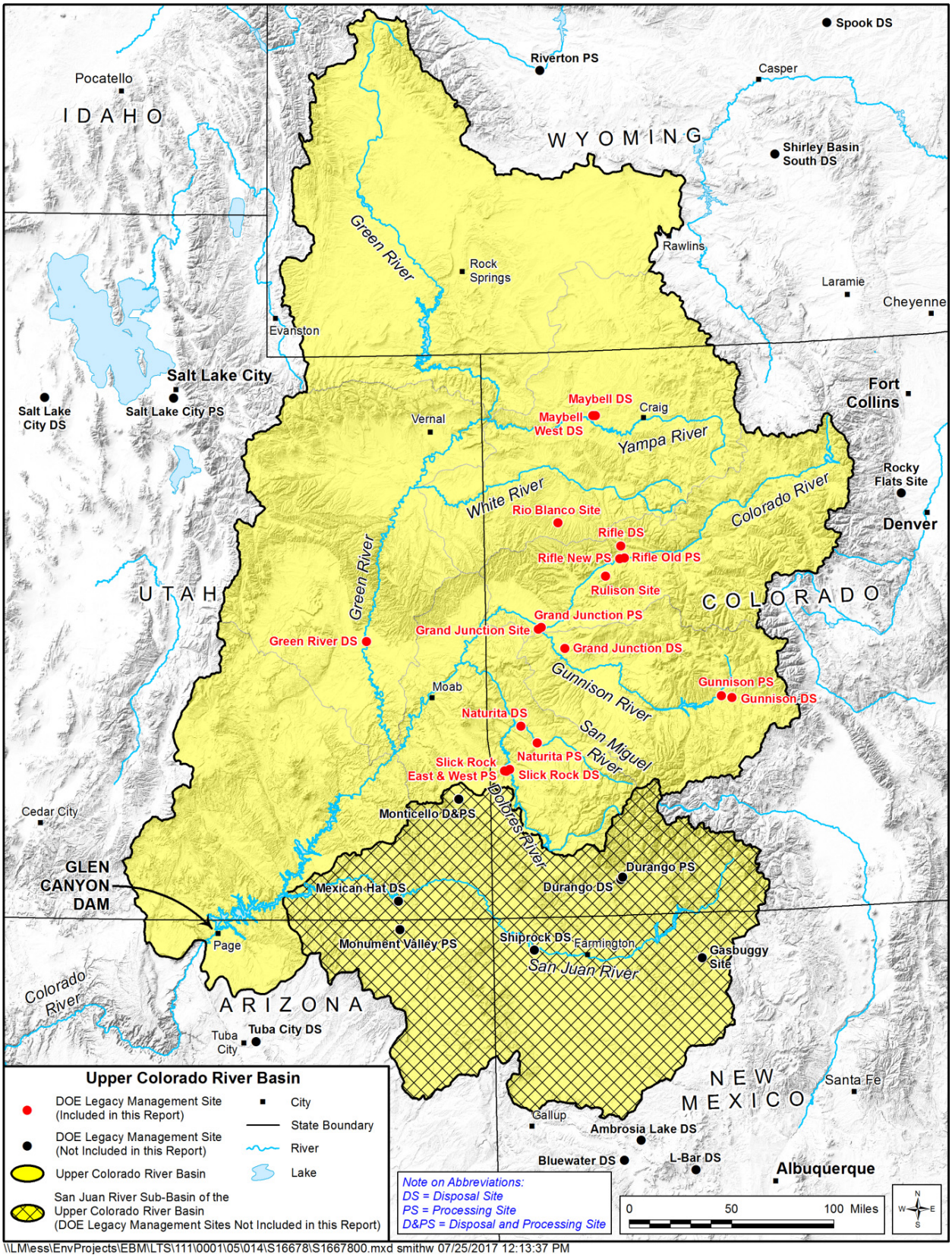

Figure 1. LM Sites Within the Upper Colorado River Basin

2.0 Proposed Action

No new actions are proposed by LM. Instead of a proposed action, this section describes routine LTS&M activities necessary to fulfill DOE's responsibilities and ensure the future protection of human health and the environment. These include groundwater and surface water monitoring, inspections, operations, maintenance, and activities related to the operation of the open disposal cell at the Grand Junction disposal site.

2.1 Description of LM Activities

Groundwater and surface water monitoring activities (summarized in Table 1) include:

- Traveling to and from sampling locations using full-size vehicles on established paved, unpaved, and two-track roads. Areas where established roads do not exist are accessed with off-road vehicles or on foot, using established routes. No new roads will be constructed. Up to two vehicles are normally present for sampling.
- Some groundwater monitoring wells need to be redeveloped prior to sampling to ensure that the well is functioning properly and high-quality samples are obtained. After wells are redeveloped, samplers typically return to the site a week or two later to collect groundwater samples from those wells. The frequency of redevelopment varies by site.
    - Wells at the Rio Blanco and Rulison sites are assumed to be redeveloped every few decades, if at all. These sites contain deep wells that require a surface discharge of 1000 gallons of water or more for each well redeveloped.
    - At the remaining LM sites, 1 in 20 wells are assumed to be redeveloped every year. An estimated 100 gallons of groundwater or less is discharged to the surface for each well redeveloped.
    - Water is discharged in accordance with all applicable regulations, and it is not discharged directly into a water body. Additionally, for most of the sites, LM has developed specific guidelines for discharge in the *Management Plan for Field-Generated Investigation-Derived Waste at UMTRCA Sites* (LMS/PLN/S04352).
- Purging monitoring wells. Prior to collecting groundwater samples, most wells are purged; purging normally requires less than an estimated 2 gallons of water per well and is done using EPA-approved methods. Purge water is discharged in accordance with the same guidelines as redevelopment water. Low-flow sampling methods are used to reduce purge water when possible.
- Collecting and preserving groundwater and surface water samples and collecting basic water-quality field data measurements (e.g., water temperature, pH, turbidity).
- Inspecting and maintaining components of wells as needed. This may involve repairing or replacing well lids, locks, casings, surface seals, or internal equipment; repainting guard posts or casings; sealing cracks in concrete structures; installing or replacing metal tags, stickers, or similar labels; minor backfilling around the well to prevent ponded water and ensure access; and trimming vegetation that obscures the well.

Table 1. Summary of Groundwater and Surface Water Samples Collected at Upper Colorado River Basin LM Sites

Locale/Site	Groundwater Wells	Surface Water Locations	Sampling Frequency
Grand Junction, Colorado			
Disposal Site	3	no sampling	annual
Processing Site	4	2	5 year
Grand Junction Site	8	6	annual
Green River, Utah, Disposal Site	15	3	annual
Gunnison, Colorado[a]			
Disposal Site	8	no sampling	5 year
Processing Site	28	6	annual
Maybell, Colorado, Disposal Site	No groundwater monitoring[b]		
Maybell West, Colorado, Disposal Site	No groundwater monitoring[c]		
Naturita, Colorado			
Disposal Site	No groundwater monitoring[d]		
Processing Site	8	4	annual
Rifle, Colorado			
Disposal Site	no wells	1	annual
Rifle (New) Processing Site	17	8	semiannual
Rifle (Old) Processing Site	8	5	semiannual
Rio Blanco, Colorado, Site	6[e]	9	annual
Rulison, Colorado, Site	9[f]	4	annual
Slick Rock, Colorado			
Disposal Site	No groundwater monitoring[d]		
East Processing Site	9	3	annual
West Processing Site	9	4	annual

Notes:

[a] The Gunnison sites, evaluated under a separate BA, are included only for effects of water depletion.

[b] Groundwater is designated as limited use because of widespread ambient contamination that cannot be cleaned up by methods reasonably employed in public water systems; therefore, supplemental standards for groundwater allowed under the Uranium Mill Tailings Radiation Control Act (Title 40 *Code of Federal Regulations* Section 192.22) have been applied.

[c] 30 years of monitoring has indicated that groundwater has not been contaminated by site-related activities.

[d] The disposal cell was constructed at a location different from that of the processing site where groundwater would not have been contaminated by site-related activities.

[e] Four of these wells are owned by DOE, and two are privately owned.

[f] One well is owned by DOE, and the remaining eight are privately owned.

LM annually inspects the eight disposal sites within the Upper Colorado River Basin and the Grand Junction site. The Grand Junction processing site is inspected every 5 years. No inspections are performed at six of the seven processing sites, the Rulison site, and the Rio Blanco site because these sites are not federally owned. Inspection activities include:

- Traveling to and from each site using full-size vehicles. Regulators from states, tribes, or other federal agencies may attend an inspection. One to three vehicles are normally present.
- Visiting and inspecting site features such as fencing, monuments, and survey markers. Full-size vehicles are used where there are existing paved, unpaved, and two-track roads, and the remainder of each site is inspected on foot.

LM performs maintenance activities at the eight LM disposal sites. These activities, performed during annual inspections or during separate visits, include:

- Repairing fences. Hand tools are used to make minor fence repairs (e.g., reattaching or replacing sections of broken wire, replacing a fence post).
- Maintaining or replacing site structures. Hand tools and materials (e.g., concrete sealant) are used to repair perimeter signs, survey markers, and other structures.
- Vegetation management. At DOE-owned sites, licensed personnel apply herbicide to noxious weed infestations in accordance with applicable regulations and label requirements. Some site maintenance plans also require removing vegetation from disposal cell covers; this is usually accomplished with herbicide or mechanical treatments such as mowing. Gravel lots may also be treated with herbicide at some sites.

Other activities are specific to the Grand Junction disposal site, which is the only open disposal cell facility within the LM system. An open portion of the cell is surrounded by a completed portion and is 1200 feet × 750 feet in size. The following activities are performed:

- Weekly security inspections—driving site access roads and checking the integrity of features such as fences, signs, buildings, empty lots, and radioactive materials postings.
- Opening the disposal site to receive and stockpile contaminated materials for future placement. This occurs on average once each year and involves use of a decontamination pad, water tank, and sump to decontaminate transport vehicles. Decontamination water is evaporated in a lined pond onsite. Water is also used for dust suppression in the cell.
- Opening the disposal site to receive contaminated material and permanently place these materials in the cell. This occurs on average once every 3 years and involves use of a decontamination pad, water tank, and sump to decontaminate transport vehicles. Decontamination water is evaporated in a lined pond onsite. Materials are also placed and compacted using heavy equipment and water to suppress dust and condition the contaminated materials mixed with soil for compaction.
- Operating site buildings (both heated and cooled): (1) 1272-square-foot decontamination operations support building with a 10,000-gallon nonpotable water tank used for equipment decontamination, a 500-gallon nonpotable water tank used to supply restroom, sink, and facilities related to decontamination (e.g., washer and dryer for reusable personal protective equipment, lockers, radiological control area, whole-body contamination monitor). (2) 720-square-foot single-wide standard office trailer. Water is pumped as needed

(e.g., restroom and sinks) to this trailer from the 500-gallon water tank in the decontamination support building.

- Site maintenance:
  - Road maintenance—repairing the asphalt pavement on the site's main access road, and grading and adding gravel as necessary to onsite dirt-covered perimeter access roads.
  - Maintaining buildings and equipment storage facilities. In addition to the site buildings described above, personnel maintain an unheated storage building; a three-sided metal shed to store a backhoe and other materials; one 20-foot metal shipping container; a fenced gravel lot; and asphalt and concrete areas surrounding several of the site buildings.
- Conducting scientific research related to disposal cell performance. This includes operating two 50-meter × 50-meter lysimeters located near the disposal cell; collecting meteorological data; and reporting data with a telemetry system. Research is also conducted at test pads located on an uncontaminated soils pile and on the surface of the closed portion of the disposal cell.

2.2 Project Areas

The Grand Junction, Rio Blanco, and Rulison sites, along with all of the processing sites, are not federally owned, so the surface is managed by other entities. All the other LM sites in the Upper Colorado River Basin are federally owned[1]. The DOE-owned disposal sites vary in size, ranging from 21.5 acres at Green River to 360 acres at Grand Junction.

The majority of the LM sites in the Upper Colorado River Basin are within the Colorado Plateaus Ecoregion (EPA 2017), an uplifted, eroded, and deeply dissected tableland. The LM sites within this ecoregion[2] are in shale deserts and sedimentary basins or semiarid benchlands and canyonlands, and they are typically surrounded by saltbush–greasewood shrublands or pinyon–juniper woodlands. The Rulison site is within the Southern Rockies Ecoregion (EPA 2017), which is characterized by high, steep mountains and geographic basins. This LM site is in a lower-elevation area within this ecoregion dominated by semidesert and sagebrush shrublands. The Maybell and Maybell West sites are within the Wyoming Basin Ecoregion (EPA 2017), a broad intermontane basin interrupted by hills and low mountains. The sites within the Wyoming Basin are surrounded by arid grasslands and shrublands.

The LM sites within the Upper Colorado River Basin are all in arid and semiarid regions. Average annual precipitation ranges from 7.1 inches at Green River to 16.8 inches at Maybell and Maybell West. Average annual temperatures are highest at the Green River site (70 °F) and lowest at the Maybell and Maybell West sites (43 °F); the Green River site frequently experiences extremes over 100 °F, and the Maybell and Maybell West sites frequently experience extremes below 10 °F (U.S. Climate Data 2017). The Green River site is lowest in elevation at 4100 feet, and the Rulison site is highest at 8150 feet.

The Grand Junction, Green River disposal, Rulison, and all of the processing sites are in alluvial areas near waterways, generally in Quaternary alluvial deposits (NRCS 2017). The other disposal

[1] LM actions at all of the sites, whether they are federally owned or not, are evaluated in this BA.
[2] LM sites in Grand Junction, Naturita, Rifle, Rio Blanco, and Slick Rock, Colorado, and in Green River, Utah.

sites overlie various formations that include the Browns Park, Morrison, Wasatch, and Green River Formations and Dakota Sandstone. Dominant vegetation at the sites and proximity to potential wetlands (USFWS 2017b) are summarized in Table 2.

Table 2. Dominant Vegetation and Wetlands at LM Sites Within the Upper Colorado River Basin

Locale/Site	Dominant Vegetation	Proximity to Potential Wetlands
Grand Junction, Colorado		
Disposal Site	Fourwing saltbush (*Atriplex canescens*), Russian thistle (*Salsola tragus*), halogeton (*Halogeton glomeratus*)	A freshwater reservoir with associated forested/shrub wetlands is approximately 3/4 mile southeast of the site, but the site does not drain into this reservoir.
Processing Site	Fourwing saltbush, reclamation grasses[a] annual weeds	Riverine and forested/shrub wetlands associated with the Colorado River are along the south edge of the site.
Grand Junction Site	Grass lawns and landscape plants, Siberian elm (*Ulmus pumila*), Russian olive (*Elaeagnus angustifolia*), Fremont cottonwood (*Populus fremontii*), reclamation grasses	During remediation, freshwater ponds and associated forested/shrub wetlands were created onsite. Riverine and forested/shrub wetlands associated with the Gunnison River border the west edge of the site.
Green River, UT, Disposal Site	Fourwing saltbush, rubber rabbitbrush (*Ericameria nauseosa*), broom snakeweed (*Gutierrezia sarothrae*), Russian thistle	The Green River and associated wetlands are approximately 1/2 mile west of the site.
Gunnison, CO, Disposal/Processing Site is evaluated under a separate BA		
Maybell, CO, Disposal Site	Reclamation grasses, rubber rabbitbrush, big sagebrush (*Artemisia tridentata*), broom snakeweed	Wetlands associated with the Rob Pit, a freshwater pond resulting from mining excavations, are approximately1/4 mile west of the site. There are some small stock ponds in the area, and several ephemeral drainages surround the site.
Maybell West, CO Disposal Site	Reclamation grasses, big sagebrush, rubber rabbitbrush, sweetclover (*Melilotus officinalis*), annual weeds	Wetlands associated with the Rob Pit, a freshwater lake resulting from mining excavations, are approximately 1/2 mile east of the site. Four seasonally wet ponds and depression wetlands are located onsite, and several ephemeral drainages surround the site.
Naturita, Colorado		
Disposal Site	Rubber rabbitbrush, reclamation grasses, sweetclover, annual weeds	The disposal site drains to Hieroglyphic Canyon approximately1/4 mile southeast of the site. The canyon contains an ephemeral drainage that discharges into the San Miguel River and associated wetlands approximately 1 mile to the northeast.
Processing Site	Fremont cottonwood, rubber rabbitbrush, greasewood (*Sarcobatus vermiculatus*), sweetclover, Russian knapweed (*Acroptilon repens*), reclamation grasses, annual weeds	Freshwater emergent and forested/shrub wetlands associated with the San Miguel River and its floodplain border the site on the northeast.
Rifle, Colorado		
Disposal Site	Broom snakeweed, western wheatgrass (*Pascopyrum smithii*), rubber rabbitbrush, big sagebrush, twoneedle pinyon (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), annual weeds	The disposal site drains to Government Creek approximately 1 mile southeast.

Table 2. Dominant Vegetation and Wetlands at LM Sites Within the Upper Colorado River Basin (continued)

Locale/Site	Dominant Vegetation	Proximity to Potential Wetlands
Rifle (New) Processing Site	Reclamation grasses cover most of the site, but wetland vegetation (rushes, grasses, trees, and shrubs) is also present	Over 60 acres of constructed and natural wetlands are present on the site along with two large freshwater lakes resulting from gravel mining. The Colorado River and associated wetlands border the site on the east. The river also borders the site approximately 1/10 mile south, across an interstate highway.
Rifle (Old) Processing Site	Rubber rabbitbrush, reclamation grasses	The Colorado River borders the site on the south, across a flood-control berm and railroad tracks.
Rio Blanco, CO, Site	Big sagebrush, reclamation grasses, annual weeds	The site contains a 3/4-mile section of Fawn Creek. A freshwater emergent wetland associated with Fawn Creek is approximately 1 mile south of the site.
Rulison, CO, Site	Quaking aspen (*Populus tremuloides*), Gambel oak (*Quercus gambelii*), reclamation grasses, annual weeds	The site contains several drainages that connect to a freshwater pond 1/10 mile northwest of the site and to freshwater ponds with forested/shrub wetlands 1/2 mile northwest of the site.
Slick Rock, Colorado		
Disposal Site	Fourwing saltbush, reclamation grasses, annual weeds	Ephemeral drainages run immediately to the north and south of the site. There are several seasonal stock ponds in the area, including one adjacent to and south of the site.
East Processing Site	Reclamation grasses, annual weeds, greasewood	The Dolores River and associated riverine and forested/shrub wetlands border the site on the west, north, and east.
West Processing Site	Reclamation grasses, annual weeds	The Dolores River and associated riverine and forested/shrub wetlands border the site on the north, east, and southeast.

Note:

[a] Grasses planted to reclaim the site after construction or remediation. These typically include native or adapted perennial species such as western wheatgrass (*Pascopyrum smithii*), intermediate wheatgrass (*Thinopyrum intermedium*), slender wheatgrass (*Elymus trachycaulus*), blue grama (*Bouteloua gracilis*), crested wheatgrass (*Agropyron cristatum*), and James's galleta (*Pleuraphis jamesii*).

3.0 Potentially Affected Species or Critical Habitat

LM performed an evaluation of T&E species that could potentially be found at the LM sites within the Upper Colorado River Basin or in downstream areas that may be affected by LTS&M activities. Table 3 lists only the species that LM determined to be potentially present or potentially affected by site activities. Appendix A lists all of the species investigated.

Table 3. Federally Listed Species Potentially Present or Potentially Affected by Site Activities

Common Name	Scientific Name	USFWS Status (Reference)	Sites
Birds			
Western yellow-billed cuckoo[a]	*Coccyzus americanus*	Threatened (USFWS 2014b)	Grand Junction Site Grand Junction Processing Naturita Processing Rifle (New) Processing
Western yellow-billed cuckoo designated critical habitat		Proposed (USFWS 2014a)	Grand Junction Site Grand Junction Processing
Fish			
Humpback chub	*Gila cypha*	Endangered (USFWS 1967)	All (downstream effects)
Bonytail chub	*Gila elegans*	Endangered (USFWS 1980)	All (downstream effects)
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered (USFWS 1967)	All (downstream effects)
Razorback sucker	*Xyrauchen texanus*	Endangered (USFWS 1991)	All (downstream effects)
Colorado pikeminnow designated critical habitat		Final (USFWS 1994)	Grand Junction Site Grand Junction Processing
Razorback sucker designated critical habitat		Final (USFWS 1994)	Grand Junction Site Grand Junction Processing
Plants			
Colorado hookless cactus	*Sclerocactus glaucus*	Threatened (USFWS 1979)	Grand Junction Disposal
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened (USFWS 1992)	Rifle (New) Processing Rulison

Note:
[a] The threatened status of the yellow-billed cuckoo applies to the western distinct population segment of the species (USFWS 2014b).

No T&E species are known to exist on the LM sites within the Upper Colorado River Basin. However, habitat for the western yellow-billed cuckoo is potentially present on or near the Grand Junction processing, Grand Junction, Naturita processing, and Rifle (new) processing sites. These sites are located along major rivers (the Colorado, Gunnison, and San Miguel Rivers) and contain thickets of riparian forest or shrub vegetation. Although the Rifle (old) processing site is also located along the Colorado River, habitat is not present, and western yellow-billed cuckoos could occur only as transients. Designated critical habitat (proposed) for this species is also present on and near the Grand Junction processing and Grand Junction sites. The Grand Junction disposal site contains potential habitat for the Colorado hookless cactus. At the Rifle (new) processing and Rulison sites, potential wetland areas exist that could provide habitat for Ute Ladies'-tresses.

None of the endangered Colorado River fish species (Colorado pikeminnow, razorback sucker, humpback chub, and bonytail chub) are physically found on the LM sites in the Upper Colorado River Basin. They are included in this BA because downstream effects (including the effects of water depletion) are being considered.

3.1 Species Accounts

This section summarizes species accounts and a description of the life history, critical habitat, and major threats for the federally listed species. The accounts were compiled from a variety of sources (CNHP 2017; CPW 2017; CSU 2017; USFWS 1979, 1992, 2002, 2013, 2014a, 2014b).

3.1.1 Endangered Colorado River Fish

Four endangered Colorado River fish species are found in areas downstream from the LM sites: the bonytail chub, Colorado pikeminnow, humpback chub, and razorback sucker. None of these species are present on the sites, so detailed species accounts and life histories are not included in this BA. However, downstream effects to water quality or depletion are considered because populations of these species are so small and habitat is so limited that upstream activities such as dewatering and degradation of water quality can potentially have effects far downstream.

Once common in the Upper Colorado River and its tributaries, these fish species experienced rapid declines in the 20th century, after the river channels were significantly altered. Especially important were large-scale dam and diversion projects that changed the speed, location, and volume of water flow and the temperature and clarity of the water in the river system. Such projects also blocked migration routes. Populations of the endangered fish are also affected by the introduction of non-native fish species that compete with, prey on, and hybridize with them and by the presence of pesticides and pollutants. The humpback chub is also threatened by parasites.

3.1.2 Western Yellow-Billed Cuckoo

The western yellow-billed cuckoo is a medium-size bird and a member of the Cuculidae family. It has a slim body with gray-brown feathers above and white feathers below, red-tinted primary feathers, and a tail with bold black and white bands on the underside. Its bill is long, fairly stout, and slightly down-curved. Males and females are not easy to distinguish in the field. Unlike most bird species, the cuckoo has a zygodactyl foot, with two toes pointing forward and two pointing backward.

Western yellow-billed cuckoos are migratory birds that breed in North America and winter in South America. They generally arrive at their breeding grounds in mid-June and depart between mid-August and mid-September. Nesting occurs between mid-June and August, and the timing varies annually with the availability of the birds' food. This species exhibits flexible nesting strategies, which can include communal nesting. They build open-cup nests in trees within large riparian woodlands. Clutch sizes are normally between two and five. Eggs hatch asynchronously in 11–12 days, and young fledge in 5–7 days. These birds can breed multiple times in a single season. Western yellow-billed cuckoos are insect specialists that prefer cicadas, katydids, caterpillars, grasshoppers, and other large insects. They also prey on small vertebrates such as tree frogs and small lizards. Many of their preferred food sources are found in abundance in healthy riparian forests.

The adult western yellow-billed cuckoo may be preyed upon by raptors such as northern harriers (*Circus cyaneus*) or Cooper's hawks (*Accipiter cooperii*). Nest predators include western scrub jays (*Aphelocoma californica*) and other bird species, snakes, and small mammals such as

raccoons (*Procyon lotor*). USFWS has defined essential physical and biological features of western yellow-billed cuckoo habitat as having (1) an abundance of large insect and small vertebrate prey; (2) flowing perennial rivers and streams of low gradient and open valleys with a broad floodplain and deposited fine sediments; (3) elevated subsurface groundwater tables and high humidity; and (4) riparian trees, including willow, cottonwood, and other species that occur within blocks of riparian habitat greater than 200 acres in extent and greater than 325 feet in width (USFWS 2014a).

The major threat to western yellow-billed cuckoos is habitat loss, degradation, and fragmentation due to human alteration of waterways and their associated wetland and riparian areas. Specific threats are surface water diversions, groundwater diversions, agricultural and other development activities, bank stabilization, levee construction and maintenance, road and bridge maintenance, gravel mining, overgrazing, pesticide drift from nearby agricultural activities, wood-cutting, and off-highway vehicle use within the riparian zone.

3.1.3 Colorado Hookless Cactus

The Colorado hookless cactus is a barrel-shaped cactus that usually grows to less than 1 foot in height. The stems are 1.2 to 4.8 inches in diameter with ribs that extend from the ground to the tip. Along the ribs are areoles with radial and central spines radiating out; the central spines are straight. The flowers are funnel- to bell-shaped and pink to magenta in color. The plant grows primarily on alluvial benches along the Colorado and Gunnison Rivers and their tributaries, on gravelly or rocky surfaces, and between 3900 and 7100 feet in elevation. It is known to occur only in Garfield, Mesa, Delta, and Montrose Counties in Colorado. Associated plant species include shadscale saltbush (*Atriplex confertifolia*), James' galleta (*Pleuraphis jamesii*), black sagebrush (*Artemisia nova*), and Indian ricegrass (*Achnatherum hymenoides*).

3.1.4 Ute Ladies'-Tresses

Ute ladies'-tresses is an herbaceous perennial plant in the Orchidaceae family. It is an orchid with narrowly linear leaves and tuberous-thickened roots. The flower spike contains small white or ivory-colored flowers arranged in a gradual spiral. The plant flowers between July and September. It grows primarily along streams and seeps between 4500 and 7750 feet in elevation. However, it has also been found on seasonally flooded river terraces, along irrigation canals, and in other human-modified wetlands. Associated plant species include horsetail (*Equisetum* spp.), milkweed (*Asclepias* spp.), creeping bentgrass (*Agrostis stolonifera*), reed grass (*Calamagrostis* spp.), and Canada thistle (*Cirsium arvense*).

4.0 Effects Analysis

4.1 Endangered Colorado River Fish

Direct effects to any of the Colorado River fish are not expected because none of the species exist on any of the LM sites within the Upper Colorado River Basin. Contaminant exposure is discountable because constituents in groundwater are well below established safe concentrations, and LM sampling procedures prevent the discharge of groundwater to a water body.

Indirect effects to the fish species are possible through water depletion. USFWS has determined that water depletions below a de minimis value of 0.1 acre-foot per year have no effect on the fish (USFWS 2009) because these effects are offset by USFWS activities. Depletions above this value are considered to have an adverse effect on the species and their designated critical habitat.

The estimated volume of depleted water from activities at LM sites within the Upper Colorado River Basin includes depletions from groundwater and surface water sampling and from operations at the Grand Junction disposal site. The maximum annual volume of depleted water from groundwater and surface water sampling is 3901 gallons per year. This value was calculated by summing:

- The maximum number of groundwater wells sampled at all of the sites within a given year (132) multiplied by the average gallons of water typically used (2).
- The estimated number of wells potentially redeveloped in a year (7) multiplied by the maximum gallons of water potentially used per redevelopment (100).
- The maximum number of surface locations sampled within a given year (55) multiplied by the maximum gallons of water potentially used per sampling event (1).
- The estimated gallons of water used annually for groundwater and surface water sampling at the Gunnison processing/disposal site (2882).

Water is also purchased commercially and used for operations at the Grand Junction disposal site. Routine facility operations consume approximately 200 gallons per year (based on 2016 usage). Every 3 years (on average), the disposal cell is opened to receive contaminated materials and to place stockpiled materials, and at this time, an additional 425,000 gallons are purchased for dust control. Therefore, an average 141,867 gallons of water are purchased for operations at the Grand Junction disposal site each year.

The maximum volume of depleted water is approximately 145,768 gallons (0.45 acre-foot) per year, which exceeds USFWS's de minimis value of 0.1 acre-foot. Therefore, operations at the LM sites within the Upper Colorado River Basin are likely to adversely affect the Colorado River endangered fish.

4.2 Colorado Pikeminnow and Razorback Sucker Critical Habitat

Designated critical habitat for the Colorado pikeminnow and razorback sucker is present in the Colorado River adjacent to the Grand Junction processing site and in the Gunnison River adjacent to the Grand Junction site. Direct effects to designated critical habitat are not expected because the critical habitat is adjacent to, but not on, the LM sites. Routine activities performed

on these sites cannot physically affect designated critical habitat and do not discharge groundwater into the rivers.

Groundwater and surface water sampling and site operations may result in indirect effects through water depletion. USFWS has determined that water depletions greater than 0.1 acre-foot per year have an adverse effect on the endangered Colorado fish species and their critical habitat (USFWS 2009). As routine LM activities result in water depletions greater than this value, they have an adverse effect on the designated critical habitat for the Colorado pikeminnow and razorback sucker.

4.3 Western Yellow-Billed Cuckoo

Only four LM sites within the Upper Colorado River Basin contain potential habitat for the western yellow-billed cuckoo: the Grand Junction, Grand Junction processing, Naturita processing, and Rifle (new) processing sites. At the other LM sites, this species could only occur as a transient, if at all. At the four sites listed above, groundwater and surface water sampling activities are conducted. However, sampling at the Grand Junction and Grand Junction processing sites could not affect western yellow-billed cuckoos because activities occur before June, when the birds arrive in the area. Annual and 5-year inspections are performed at the Grand Junction and Grand Junction processing sites, respectively. These inspections are also completed before the birds arrive and could not affect the species. LM does not perform maintenance activities such as noxious weed control at any of these four sites. Therefore, the western yellow-billed cuckoo could only be affected by groundwater and surface water sampling at the Naturita and Rifle (new) processing sites.

The Naturita processing site has eight groundwater wells and four surface water locations, sampled annually in July. It typically takes one work day to sample this site. The Rifle (new) processing site has 17 groundwater wells and 8 surface water locations, sampled twice annually in June and November. It typically takes three work days to sample this site. For the purposes of this BA, it is assumed that one additional annual day trip to each site will be necessary to sample wells that have been redeveloped.

Western yellow-billed cuckoos are not known to exist at the Naturita or Rifle (new) processing sites. It is possible that individual birds could be present because suitable habitat may be present, but it is unlikely that significant populations of this species would be in the area. If present, individual birds could be affected by groundwater and surface water sampling activities in June and July. Disturbance from sampling activities would be temporary and restricted to small areas around monitoring wells and surface sampling locations.

Direct effects from groundwater and surface water sampling activities could result from (1) traveling to and from individual wells and surface water sampling locations using off-road vehicles or on foot; and (2) operating pumping and sampling equipment and hand-held tools that generate low-level noise and discharge water onto the ground surface. These activities may startle or temporarily stress birds. Direct effects would be temporary and insignificant because sampling activities are low-impact, infrequent, and of short duration.

Indirect effects to western yellow-billed cuckoos could occur through (1) the spread of invasive weeds and seeds via vehicles and pedestrians, which may alter the availability of food

(macroinvertebrates, small reptiles, and amphibians); and (2) contaminant exposure or changes in humidity resulting from the discharge of groundwater to the surface during well redevelopment or purging. Indirect effects would be insignificant because foot and vehicle traffic associated with sampling activities is infrequent, extremely localized, and short-term, minimizing the risk of spreading noxious weeds. Any impacts from the spread of noxious weeds, however, would be long term because LM does not control weeds at the processing sites. Exposure to contaminants is discountable because constituents in groundwater are well below established safe concentrations. Short-term, localized changes in humidity could result from discharging water, but these impacts would also be insignificant and temporary.

4.4 Western Yellow-Billed Cuckoo Critical Habitat

Designated critical habitat (proposed) for the western yellow-billed cuckoo is present on or near the Grand Junction and Grand Junction processing sites. Direct and indirect impacts to the species' designated critical habitat are discountable because none of the activities performed at these sites involve significantly altering vegetation or degrading habitat.

4.5 Colorado Hookless Cactus

The Colorado hookless cactus is unlikely to exist at any LM site within the Upper Colorado River Basin except the Grand Junction disposal site. Soils at the Grand Junction disposal site are colluvial, derived from Mancos Shale, and have a volcanic gravelly or rocky surface. This is the preferred habitat of the species. In the late 2000s, a population of Colorado hookless cactus was found on a privately owned parcel of land adjacent to the Grand Junction disposal site by a private party. It is unlikely that this species exists at the LM site because the majority of the site surface was disturbed during construction of the disposal cell, and because vegetation surveys as recent as 2010 did not find any Colorado hookless cactus on the site. However, small areas near the site's fence line contain relatively undisturbed soils with a rocky surface that could provide habitat for the Colorado hookless cactus.

Groundwater sampling and activities related to the operation of the open disposal cell facility could not affect this species because they occur within areas of disturbed soils without a rocky surface. Direct effects to this species, if it were present on the site, could result from inspection or maintenance activities. Individual cacti could be damaged by walking across areas of land to access perimeter signs and survey markers, or by repairing signs or fence. Vehicles would not be used to access potential habitat for the cactus because no paved, unpaved, or two-track roads exist in these areas. Applying herbicide to control noxious weed infestations could damage or kill individual plants if it were applied to areas where the plants were growing.

Direct effects to the Colorado hookless cactus are unlikely because no plants are known to be present at the site. If they were present or began to colonize the site from adjacent areas, damage to plants from walking and fence maintenance would be discountable because these activities are infrequent, localized, and of short duration. If they were present at the site, plants could be adversely affected by herbicide applications, which could kill or damage individual plants. Most site applications are within disturbed areas that are not potential cactus habitat. Noxious weeds found in native areas are spot-treated by hand and therefore highly localized. Herbicides are applied by licensed personnel in accordance with all applicable guidelines and regulations. It is

therefore possible, but unlikely that Colorado hookless cactus would be directly affected by site activities.

Indirect effects to the Colorado hookless cactus are not likely to occur from activities at the Grand Junction disposal site. However, controlling noxious weeds improves habitat and prevents the spread of these invasive plants into nearby native areas with undisturbed soils. Therefore, indirect effects would be beneficial.

4.6 Ute Ladies'-Tresses

The Rifle (new) processing and Rulison sites contain potential wetland areas that could be habitat for Ute ladies'-tresses. Only groundwater and surface water sampling occurs at these sites. At the Rifle (new) processing site, 17 groundwater wells and 8 surface locations are sampled twice annually; at the Rulison site, nine domestic wells and four surface locations are sampled annually.

The Rifle (new) processing site contains over 40 acres of U.S. Army Corps of Engineers mitigation wetlands created in the late 1990s. These are primarily emergent wetlands with some shrub- and forest-covered areas. LM monitored these wetlands until completion of its Clean Water Act 404 permit in January 2011. No evidence of Ute ladies'-tresses was found during the monitoring period. The site is now owned and managed by the City of Rifle. Although this species is not known to exist at the Rifle (new) processing site, Ute ladies'-tresses could colonize onsite wetlands, some of which were created during site remediation and reclamation. No vegetation surveys have been performed by LM at the Rulison site, but a stream runs through the site that may provide potential habitat for Ute ladies'-tresses.

Direct effects from groundwater and surface water sampling at the Rifle (new) processing and Rulison sites could result from accessing sampling locations, discharging groundwater to the surface, or minor maintenance of well structures. These activities have the potential to physically damage or destroy individual plants, if present.

Direct effects to Ute ladies'-tresses are insignificant. Accessing sampling locations and well maintenance activities would be unlikely to affect the species because these activities are infrequent, localized, and of short duration. All of the wells within wetland areas are accessed on foot, as established roads are not present in the wetland areas. Discharging groundwater to the surface is unlikely to adversely affect the species because the orchid is adapted to high-water environments, and constituents in the water are well below established safe concentrations. Eight of the nine water sample locations at the Rulison site are collected from existing private, domestic wells with existing and well-traveled access areas; these wells are not purged or redeveloped. Therefore, direct effects from sampling at the Rulison site are also insignificant.

No indirect effects to Ute ladies'-tresses from LM activities are likely to occur.

4.7 Cumulative Effects

Cumulative effects could result from LTS&M activities interacting with other activities in the area of LM sites within the Upper Colorado River Basin. Other activities that may adversely affect the western yellow-billed cuckoo or its critical habitat include residential and commercial

development and recreational use of areas near the Colorado and Gunnison Rivers. LM is not aware of any new state, county, or municipal approvals for planned residential or commercial development near any of the sites. The City of Grand Junction continues to develop portions of the Grand Junction processing site into a city public and business park. These developments are near, but do not occur within, areas with potential habitat for western yellow-billed cuckoos. Portions of the river corridors near the LM sites are used by recreational vehicles, including boats.

Cumulative effects of water depletion on Colorado River endangered fish can result from municipal, private, agricultural, or commercial water depletions. LM's depletion of 0.45 acre-foot per year represents a small contribution to water depletions within the Upper Colorado River Basin.

4.8 Summary of Effects

LM has determined that the four species of endangered Colorado River fish are **likely to be adversely affected** by water depletion but not likely to be affected by other site activities. Designated critical habitat for the Colorado pikeminnow and razorback sucker is also **likely to be adversely affected** by water depletion but not likely to be affected by other site activities. The western yellow-billed cuckoo (threatened) **may be affected but is not likely to be adversely affected** by routine activities on and near the LM sites within the Upper Colorado River Basin. Designated critical habitat for the western yellow-billed cuckoo is present on or near several LM sites, but it is **not likely to be affected** by site activities. Colorado hookless cactus and Ute Ladies'-tresses **may be affected but are not likely to be adversely affected** by routine activities. Cumulative effects from LM activities are not likely to be significant.

4.9 Conservation Measures

Table 4 summarizes conservation measures that LM has implemented or is planning to implement to minimize or eliminate impacts to T&E or candidate species at its sites within the Upper Colorado River Basin.

Table 4. Conservation Measures at LM Sites in the Upper Colorado River Basin

Conservation Measure	Description
Environmental Management System (EMS)	LM has implemented an EMS for all of its activities. The EMS focuses on environmental compliance and environmental sustainability. Guidelines and procedures in the EMS are incorporated into activity planning and reduce negative impacts from routine activities. EMS areas specifically related to conservation that may result in reduced impacts to T&E species potentially present at the LM sites in the Upper Colorado River Basin include water conservation, climate change adaptation, sustainable acquisition, and waste minimization and pollution prevention. Environmental aspects are also regularly reviewed for these sites.
Sampling procedures	Low-flow purging and sampling procedures have been established for groundwater and surface water sampling. These procedures substantially reduce the generation of water and the impacts of water sampling at many LM sites. Field-generated investigation-derived waste is also managed to reduce or eliminate environmental impacts at most sites (DOE 2017).

Table 4. Conservation Measures at LM Sites in the Upper Colorado River Basin (continued)

Conservation Measure	Description
Integrated Pest Management (IPM)	LM and its contractors use IPM when planning noxious weed control activities. IPM emphasizes a site-specific approach utilizing alternatives to herbicide (e.g., biocontrol insects) where possible. Herbicides are applied at LM sites using spot treatment rather than broadcast treatments whenever possible and effective. LM has also evaluated all of its sites and is in compliance with National Pollutant Discharge Elimination System regulations related to herbicide use.
Limited herbicide application	LM will only apply herbicide to disturbed, reclaimed areas at the Grand Junction disposal site. If noxious weeds are found within areas of native soil, surveys for the Colorado hookless cactus will be performed prior to application, and if individual cacti are found, herbicide will not be applied in these areas.

Abbreviations:
EMS = Environmental Management System
IPM = Integrated Pest Management

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Appendix A

T&E Species at LM Sites
Within the Upper Colorado River Basin

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Table A-1. T&E Species at LM Sites Within the Upper Colorado River Basin

Species	Common Name	Status	Site(s)	Habitat	Habitat Present on Sites?	Notes
Carex specuicola	Navajo sedge	Threatened	Green River Disposal	In hanging gardens within Great Basin conifer woodland	No	No hanging gardens present on any site.
Centrocercus minimus	Gunnison sage-grouse	Threatened	Green River Disposal Naturita Processing	Sagebrush-dominated areas	No	Shrub areas on or near both sites dominated by rubber rabbitbrush, not sagebrush.
Coccyzus americanus	Yellow-billed cuckoo	Threatened	Grand Junction Disposal/Processing Grand Junction Site Green River Disposal Naturita Disposal/Processing Rifle Disposal/Processing Rio Blanco	Wooded habitat with dense cover and water nearby, including woodlands with low, scrubby vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes. Nests are often placed in willows along streams and rivers, with nearby cottonwoods serving as foraging sites.	Yes	Proposed designated critical habitat is present on or near the Grand Junction processing and Grand Junction sites. Habitat is potentially present on or near the Naturita processing site. No habitat is present on or near the Grand Junction disposal, Green River disposal, Naturita disposal, Rifle disposal, Rifle (new) processing, Rifle (old) processing, or Rio Blanco sites.
Cycladenia humilis var. *jonesii*	Jones cycladenia	Threatened	Green River Disposal	In mixed desert scrub, juniper, or wild buckwheat/Mormon tea communities between 4390 and 6000 feet in elevation, on gypsiferous, saline soils of Cutler, Summerville, and Chinle Formations.	No	Cutler, Summerville, and Chinle Formations not present at any of the sites.
Empidonax traillii var. *extimus*	Southwestern willow flycatcher	Endangered	Green River Disposal	Breeding habitat is brushy areas of willow and similar shrubs	No	Suitable habitat is not present on the site; the species could occur as a transient only.
Gila cypha	Humpback chub	Endangered	Grand Junction Disposal/Processing Grand Junction Site Green River Disposal Maybell Disposal Maybell West Disposal Naturita Disposal/Processing Rifle Disposal/Processing Rio Blanco Rulison Slick Rock Disposal/Processing	Large river systems; an aquatic species	No, but downstream effects possible	Water depletions at any of these sites could affect this species.
Gila elegans	Bonytail chub	Endangered	Grand Junction Disposal/Processing Grand Junction Site Green River Disposal Maybell Disposal Maybell West Disposal Naturita Disposal/Processing Rifle Disposal/Processing Rio Blanco Rulison Slick Rock Disposal/Processing	Large river systems; an aquatic species	No, but downstream effects possible	Water depletions at any of these sites could affect this species.
Gulo gulo luscus	North American wolverine	Proposed threatened	Grand Junction Disposal/Processing Grand Junction Site Maybell Disposal Maybell West Disposal Naturita Disposal/Processing Rifle Disposal/Processing Rio Blanco Rulison Slick Rock Disposal/Processing	Areas that are cold and receive enough winter precipitation to reliably maintain deep persistent snow late into the warm season.	No	Proposed Threatened in 2016. In 2014, USFWS withdrew a proposal to list because it is recovering. USFWS reports that individuals have moved into the southern Rocky Mountains. No habitat is present at any of the LM sites.
Gymnogyps californianus	California condor	Endangered	Green River Disposal	Rocky, open-country scrubland, coniferous forest, and oak savanna. Cliffs, rocky outcrops or large trees are used as nest sites. May range more than 400 kilometers from release sites.	No	The species could be present as a transient only.
Lynx canadensis	Canada lynx	Threatened	Rulison	Moist boreal forest	No	Suitable habitat is not present at any of the LM sites.
Oncorhynchus clarki stomias	Greenback cutthroat trout	Threatened	Grand Junction Disposal/Processing Grand Junction Site Naturita Disposal/Processing Rifle Disposal/Processing Rulison	Coldwater streams and lakes with clear, cold, well-oxygenated water; an aquatic species	No	Habitat is not present on or downstream of any of the LM sites.

Table A-1. T&E Species at LM Sites Within the Upper Colorado River Basin (continued)

Species	Common Name	Status	Site(s)	Habitat	Habitat Present on Sites?	Notes
Phacelia submutica	Debeque phacelia	Threatened	Rifle Disposal/Processing Rulison	Restricted to exposures of chocolate to purplish-brown and dark-charcoal gray alkaline clay soils derived from the Atwell Gulch and Shire members of the Wasatch Formation; adapted to early pioneer habitats with sparse vegetation cover	No	Soils at the Rulison site are derived from the Green River Formation, and soils at the Rifle Processing sites are derived from alluvial deposits, so this species could not exist there. Soils derived from the Wasatch Formation are present at the Rifle disposal site, but they are within established pinyon–juniper forest, not early pioneer habitats.
Ptychocheilus lucius	Colorado pikeminnow	Endangered	Grand Junction Disposal/Processing Grand Junction Site Green River Disposal Maybell Disposal Maybell West Disposal Naturita Disposal/Processing Rifle Disposal/Processing Rio Blanco Rulison Slick Rock Disposal/Processing	Large river systems; an aquatic species	No, but downstream effects possible	Water depletions at any of these sites could affect this species. Designated critical habitat is present in the Colorado and Gunnison Rivers adjacent to the Grand Junction processing and Grand Junction sites.
Sclerocactus glaucus	Colorado hookless cactus	Threatened	Grand Junction Disposal/Processing Grand Junction Site	Primarily on alluvial benches along the Colorado and Gunnison Rivers and their tributaries. On gravelly or rocky surfaces on river terrace deposits and lower mesa slopes. Soils are usually coarse, gravelly river alluvium above the river flood plains, usually consisting of Mancos shale with volcanic cobbles and pebbles on the surface.	Yes	This species was found on a parcel adjacent to the Grand Junction disposal site, and the site contains small areas of undisturbed, coarse gravelly river alluvial soils. Habitat is unlikely to exist at the Grand Junction processing and Grand Junction sites because these sites do not contain any areas with gravelly, undisturbed soils or mature native plant communities.
Spiranthes diluvialis	Ute ladies'-tresses	Threatened	Maybell Disposal Maybell West Disposal Rifle Disposal/Processing Rulison	Moist meadows associated with perennial streams, seasonally flooded river terraces, subirrigated or spring-fed abandoned stream channels and valleys, and lakeshores. Also along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside ditches, reservoirs, and other human-modified wetlands.	Yes	Human-modified wetlands are present on the Rifle (new) processing, and Rulison sites. During vegetation surveys in 2009, no evidence of this species was found at the Maybell west disposal site; potential wetland areas at the site are grazed or recently created and contain primarily low-quality habitat species. No habitat is present on or near the Maybell disposal, Rifle (old) processing, and Rifle disposal sites.
Strix occidentalis lucida	Mexican spotted owl	Threatened	Grand Junction Disposal/Processing Grand Junction Site Green River Disposal Maybell Disposal Maybell West Disposal Naturita Disposal/Processing Rifle Disposal/Processing Rio Blanco Rulison Slick Rock Disposal/Processing	Old-growth or mature forests; canyons with riparian or conifer communities are also important components. Also found in canyon habitat dominated by vertical-walled rocky cliffs within complex watersheds, including tributary side canyons.	No	Habitat is not present on or near any of the sites.
Xyrauchen texanus	Razorback sucker	Endangered	Grand Junction Disposal/Processing Grand Junction Site Green River Disposal Maybell Disposal Maybell West Disposal Naturita Disposal/Processing Rifle Disposal/Processing Rio Blanco Rulison Slick Rock Disposal/Processing	Large river systems; an aquatic species	No, but downstream effects possible	Water depletions at any of these sites could affect this species. Designated critical habitat is present in the Colorado and Gunnison Rivers adjacent to the Grand Junction processing and Grand Junction sites.

Appendix B

Biological Opinion

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Colorado Ecological Services

IN REPLY REFER TO:
FWS/R6/ES CO

Front Range:
Post Office Box 25486
Mail Stop 65412
Denver, Colorado 80225-0486

Western Slope:
445 W. Gunnison Avenue
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Grand Junction, Colorado 81501-5711

ES/GJ-6-CO-09-F-001-GP038
TAILS 06E24100-2018-F-0313

September 5, 2018

Mark Kautsky
Acting Environmental Team Lead
Office of Legacy Management
2597 Legacy Way
Grand Junction, Colorado 81503

Dear Mr. Kautsky:

This responds to your April 19, 2018 request for formal consultation under section 7 of the Endangered Species Act of 1973 (ESA), as amended. Your request is for the U.S. Department of Energy Office of Legacy Management (OLM) Activities at Sites in the Upper Colorado River Basin located at multiple locations in watersheds of the Colorado, Dolores, Green, Gunnison, San Miguel, White, and Yampa Rivers.

We have reviewed your correspondence and biological assessment for the project and concur with your determination that the proposed action may affect, but is not likely to adversely affect Yellow-billed cuckoo (*Coccyzus americanus*) and its designated critical habitat, Colorado hookless cactus (*Sclerocactus glaucus*), and Ute ladies'-tresses (*Spiranthes diluvialis*).

The project will cause an average annual depletion of 0.44 acre-feet (AF)/year (yr) to the Gunnison River, with a maximum depletion of 1.31 AF/yr in any one year, which may affect the endangered Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), bonytail (*Gila elegans*), and their designated critical habitat. All other depletions analyzed in your Biological Assessment are below the *de minimus* value of 0.1 AF/yr in their respective watershed, and are, therefore, not addressed further in this Biological Opinion.

A Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin was initiated on January 22, 1988. The Recovery Program was intended to be the reasonable and prudent alternative to avoid jeopardy to the endangered fishes from impacts of water depletions to the Upper Colorado River Basin. In order to further define and clarify the process in the Recovery Program, a section 7 agreement was implemented on October 15, 1993, by the Recovery Program participants. Incorporated into this agreement is a Recovery

Implementation Program Recovery Action Plan (RIPRAP) which identifies actions currently believed to be required to recover the endangered fishes in the most expeditious manner.

On December 4, 2009, the Fish and Wildlife Service (Service) issued the final Gunnison River Basin Programmatic Biological Opinion (PBO) (this document is available for viewing at the following internet address: http://www.coloradoriverrecovery.org/documents-publications/section-7-consultation/GUPBO.pdf). The Service has determined that projects that fit under the umbrella of the Gunnison River PBO would avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletion impacts to the Gunnison River basin. For projects involving water depletions less than 100 AF/yr to fit under the umbrella of the Gunnison River PBO, the Federal agency requesting consultation must document the project location, the amount of the water depletion, identify if the depletion is new or historic, and provide the information to the Service when consultation is initiated. This information was provided in your consultation request, therefore, the requirements have been met for the subject project to fit under the umbrella of the Gunnison River PBO.

The Service and the Recovery Program track all water depletions that are covered under the Gunnison River PBO on a quarterly basis. A summary of those depletions are available at: http://www.coloradoriverrecovery.org/documents-publications/section-7-consultation/consultation-list.html . Also, in accordance with the Section 7, Sufficient Progress, and Historic Projects Agreement, the Service reviews cumulative accomplishments and shortcomings of the Recovery Program in the upper Colorado River basin. Per that Agreement, the Service uses the following criteria to evaluate whether the Recovery Program is making "sufficient progress" toward recovery of the four listed fish species:

- actions which result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction;
- status of the fish populations;
- adequacy of flows;
- and magnitude of the impact of projects.

Through these bi-annual Sufficient Progress reviews the Service evaluates the best available and current information to determine if the Recovery Program continues to offset depletion effects identified in existing Section 7 consultations including the depletions covered by these PBOs. In the most recent assessment (dated December 10, 2017), the Service determined that sufficient progress has been made towards recovery. Sufficient Progress reports can be found at: http://www.coloradoriverrecovery.org/documents-publications/section-7-consultation/sufficient-progress-letters.html.

The Service requests that the OLM retain discretionary Federal authority for the subject project in case reinitiation of section 7 consultation is required. For your information the reinitiation notice from the Gunnison River PBO is presented below.

REINITIATION NOTICE

This concludes formal consultation on the subject action. The proposed action includes adaptive management because additional information, changing priorities, and the development of the States' entitlement may require modification of the Recovery Action Plan. Therefore, the Recovery Action Plan is reviewed annually and updated and changed when necessary and the required time frames include changes in timing approved by means of the normal procedures of the Recovery Program, as explained in the description of the proposed action. Every 2 years, for the life of the Recovery Program, the Service and Recovery Program will review implementation of the Recovery Action Plan actions that are included in this biological opinion (BO) to determine timely compliance with applicable schedules. As provided in 50 CFR sec. 402.16, reinitiation of formal consultation is required for new projects where discretionary Federal Agency involvement or control over the action has been retained (or is authorized by law) and under the following conditions:

1. **The amount or extent of take specified in the incidental take statement for this opinion is exceeded**. The terms and conditions outlined in the incidental take statement are not implemented. The implementation of the proposed reoperation of Aspinall and the Selenium Management Program will further decrease the likelihood of take caused by water depletion impacts.

2. **New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion**, such as impacts due to climate change. In preparing this opinion, the Service describes the positive and negative effects of the action it anticipates and considered in the section of the opinion entitled "EFFECTS OF THE ACTION."

3. **The identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the BO.** It would be considered a change in the action subject to consultation if the reoperation of Aspinall and the Selenium Management Program described in this opinion are not implemented within the required timeframes. If a draft Selenium Management Program document is not completed within 18 months of the final PBO and a final document within 24 months, reinitiation of consultation will be required. Reinitiating consultation could consist of an exchange of memoranda examining the progress made on the plan and evaluating the consequences of extending the timeframe. Also, at any time, if funding is not available to implement the Selenium Management Program reinitiation of consultation will be required.

   The analysis for this BO assumed implementation of the Colorado River Mainstem Action Plan of the RIPRAP because the Colorado pikeminnow and razorback sucker that occur in the Gunnison River use the Colorado River and are considered one population. The essential elements of the Colorado River Plan are as follows: 1) provide and protect instream flows; 2) restore floodplain habitat; 3) reduce impacts of nonnative fishes; 4) augment or restore populations; and 5) monitor populations and conduct research to support recovery actions. The analysis for the non-jeopardy determination of the proposed action that includes about 37,900 AF/yr of new water depletions from the

Gunnison River Basin relies on the Recovery Program to provide and protect flows on the Gunnison and Colorado Rivers.

4. **The Service lists new species or designates new or additional critical habitat, where the level or pattern of depletions covered under this opinion may have an adverse impact on the newly listed species or habitat.** If the species or habitat may be adversely affected by depletions, the Service will reinitiate consultation on the PBO as required by its section 7 regulations. The Service will first determine whether the Recovery Program can avoid such impact or can be amended to avoid the likelihood of jeopardy and/or adverse modification of critical habitat for such depletion impacts. If the Recovery Program can avoid the likelihood of jeopardy and/or adverse modification of critical habitat no additional recovery actions for individual projects would be required, if the avoidance actions are included in the Recovery Action Plan. If the Recovery Program can't avoid the likelihood of jeopardy and/or adverse modification of critical habitat then the Service will reinitiate consultation and develop reasonable and prudent alternatives.

If the annual assessment from Bureau of Reclamation's (Reclamation) reports indicates that the operation of the Aspinall Unit to meet flow targets or that the Selenium Management Program, as specified in this opinion has not been implemented as proposed, Reclamation will be required to reinitiate consultation to specify additional measures to be taken by Reclamation or the Recovery Program to avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletions and water quality. Also, if the status of all four fish species has not sufficiently improved, as determined by the Service in a formal sufficient progress finding under provisions of the Recovery Program, Reclamation will be required to reinitiate consultation. If other measures are determined by the Service or the Recovery Program to be needed for recovery prior to the review, they can be added to the Recovery Action Plan according to standard procedures. If the Recovery Program is unable to complete those actions which the Service has determined to be required, Reclamation will be required to reinitiate consultation in accordance with ESA regulations and this opinion's reinitiation requirements.

All individual consultations conducted under this programmatic opinion will contain language requesting the applicable Federal agency to retain sufficient authority to reinitiate consultation should reinitiation become necessary. The recovery agreements to be signed by non-Federal entities who rely on the Recovery Program to avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletion impacts related to their projects will provide that such non-Federal entities also must request the Federal agency to retain such authority. Non-Federal entities will agree by means of recovery agreements to participate during reinitiated consultations in finding solutions to the problem which triggered the reinitiation of consultation.

This concludes formal consultation for the subject project. If you have any questions regarding this consultation or would like to discuss it in more detail, please contact Aimee Crittendon of our Western Slope Field Office at (970) 628-7195, email: Aimee_Crittendon@fws.gov.

Sincerely,

Ann Timberman
Western Slope Supervisor

cc: FWS/UCREFRP, Denver; Email:Kevin_McAbee@fws.gov

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