

**United States Department of the Interior
Bureau of Land Management**

**Environmental Assessment
for the Alanco Energy Services, Inc.
Indian Mesa Disposal Facility Access EA**

Grand Junction Field Office
2815 H Road
Grand Junction, Colorado 81506

DOI-BLM-CO-130-2013-0029-EA

March 2015



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List of Abbreviations and Acronyms

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
AASHTO	American Association of State Highway and Transportation Officials
ACEC	Area of Critical Environmental Concern
AES	Alanco Energy Services, Inc.
amsl	above mean sea level
AO	Authorized Officer
AUMs	Animal Unit Months
BA	Biological Assessment
BCC	Birds of Conservation Concern
BCR	Bird Conservation Regions
BLM	Bureau of Land Management
BMPs	Best Management Practices
CAAQS	Colorado Ambient Air Quality Standards
CASTNET	Clean Air Status and Trends Network
CDPHE	Colorado Department of Public Health and Environment
CDNR	Colorado Department of Natural Resources
CDOLA	Colorado Department of Local Affairs
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDWR	Colorado Division of Water Resources
CEAA	Cumulative Effects Analysis Area
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
CO	carbon monoxide
COE	U.S. Army Corps of Engineers
CPW	Colorado Parks and Wildlife
CUP	Conditional Use Permit
DAU	Data Analysis Unit
dB	decibels
dBA	decibels on the A-weighted scale
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DWR	Division of Water Resources
EA	Environmental Assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act of 1976
FWS	U.S. Fish and Wildlife Service
GJFO	Grand Junction Field Office
GRI	Grand River Institute
GMU	Game Management Unit
GVP	Grand Valley Power
HAPs	hazardous air pollutants
HDPE	high density polyethylene
IFMP	Interagency Fire Management Plan
IMPROVE	Interagency Monitoring of Protected Visual Environments
kV	kilovolt
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding

mph	miles per hour
NAAQS	National Ambient Air Quality Standards
NADP	National Acid Deposition Program
NCA	National Conservation Area
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTN	National Trends Network
O ₃	ozone
OST	Old Spanish Historic Trail
PCE	primary constituent element
PFYC	Potential Fossil Yield Classification
PM _{2.5}	particulate matter less than 2.5 microns in effective diameter
PM ₁₀	particulate matter less than 10 microns in effective diameter
POD	Plan of Development
PLS	pure live seeds
PRPA	Paleontological Resources Protection Act
RCRA	Resource Conservation and Recovery Act
RMP	Resource Management Plan
ROD	Record of Decision
ROW's	rights-of-ways
SHPO	State Historic Preservation Officer
SUIT	Southern Ute Indian Tribe
UAA	use attainability analysis
UIT	Ute Indian Tribe of the Uintah and Ouray Reservation
UMUT	Ute Mountain Ute Tribe
USC	United States Code
USGS	United States Geologic Survey
VRM	Visual Resource Management
WoUS	Waters of the U.S.
WQCC	Water Quality Control Commission
WRCC	Western Regional Climate Center
WSA	Wilderness Study Area

CHAPTER 1 - INTRODUCTION

1.1 IDENTIFYING INFORMATION

This Environmental Assessment (EA) has been prepared in response to Alanco Energy Services, Inc.'s (AES') and Grand Valley Power's (GVP's) applications for Rights-of-Ways (ROWs) for transportation and utility systems on federal lands (SF299s) to the Bureau of Land Management (BLM) Grand Junction Field Office (GJFO). The ROWs are requested for access and power to the proposed commercial Indian Mesa Disposal Facility (Disposal Facility) on 160 acres of private land located in Mesa County, Colorado. AES requests the following:

- a grant for 5,110-feet (30-feet-wide) of ROW (3.52 acres) on top of the existing U.S. Department of Energy – DOE Access Road (COC043106) to the existing DOE Cheney Site, a mill tailings disposal cell.
- a grant for 730 feet (60-feet-wide for 40 feet, 30-feet-wide for 690 feet) of ROW (0.53 acre) from the existing DOE Access Road to the proposed Disposal Facility – the Indian Mesa Access Road (varying widths of the right-of-way are necessary to accommodate widening of the access road for turning), for a total access road acreage of 4.05 acres. This access road is serialized as COC074173.
- a short-term ROW (0.17 acre) for 736 feet (5-feet-wide) on the west side of the Indian Mesa Access Road and 728 feet (5-feet-wide) on the east side of the Indian Mesa Access Road from the DOE Access Road to the proposed Disposal Facility. This short-term ROW will be serialized as COC074173-01.

GVP's application requests the following:

- a grant for 621 feet (20 feet wide) of ROW (0.29 acre) from the existing GVP power line right-of-way for the DOE Cheney Site to the proposed Disposal Facility. This ROW is an amendment to COC050800.

AES submitted a Plan of Development (POD) for the access ROWs to the BLM GJFO, which describes construction, reclamation, operation, maintenance, and abandonment of the Proposed Action.

AES applied for a Conditional Use Permit (CUP) from Mesa County and received approval of the CUP (Resolution No. MGM 2010-089, Planning Department No. 2010-0031CUP1) for development of a non-hazardous waste recycling facility that would accept oil and gas production fluids to be treated through evaporation, and accept and treat drilling sludge, sand, grease trap sludge, and other petroleum contaminated soils through land-farming. An amendment to the CUP was applied for and approved by Mesa County (Resolution No. B0CC 2014-17, Planning Department No. 2013-0112 CUP) to include a landfill in addition to land-farming for disposal of wastes from oil and gas exploration and production.

Under the National Environmental Policy Act (NEPA), the Disposal Facility is considered a non-federal connected action because it is proposed entirely on private lands. Because the NEPA process is focused on federal agency decision making (Code of Federal Regulations - CFR 1500.1(c), 40 CFR §1508.18, 40 CFR §1508.23), the consideration of a non-federal connected action is limited in the NEPA analysis (BLM, 2008a). The non-federal action does not require development of a purpose and need; nor does it require consideration of alternatives.

This EA was prepared in conformance with the policy guidance provided in the BLM's NEPA Handbook H-1790-1 (BLM, 2008a). The BLM Handbook provides instructions for compliance with the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR §1500-1508) and U.S. Department of the Interior (DOI) Manual 516 DM 1-7 on NEPA compliance (DOI, 2005).

CASEFILE/PROJECT NUMBER: COC074173 and COC074173-01 Alanco DOI-BLM-CO-130-2014-0029-EA. COC050800, Grand Valley Power.

PROJECT NAME: Indian Mesa Disposal Facility Access EA

PLANNING UNIT: Grand Junction Field Office

1.2 PROJECT LOCATION AND LEGAL DESCRIPTION

The Disposal Facility is proposed in Mesa County, approximately 8 miles southeast of Whitewater, Colorado in the Juniata Mesa Colorado U.S. Geologic Survey (USGS) Quadrangle. Access to the Disposal Facility would begin on BLM-administered lands at the junction of U.S. Highway 50 and the existing DOE Access Road. The Disposal Facility would be located approximately 1.0 mile (5,110 feet) east of U.S. Highway 50 on private land. The proposed Disposal Facility would be located west of the existing DOE Cheney Site (see Map 1.2-1).

The legal location for the Indian Mesa Access Road and power line on BLM-administered lands is as follows:

Ute Meridian	T 3 S, R 2 E Section 9, SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 10, S $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ -SE $\frac{1}{4}$.
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The legal location for the Disposal Facility on private land is as follows:

Ute Meridian	T 3 S, R 2 E Section 15, E $\frac{1}{2}$ NE $\frac{1}{4}$; Section 14, W $\frac{1}{2}$ NW $\frac{1}{4}$.
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1.3 PURPOSE AND NEED

The purpose for the Proposed Action is to provide and allow access and electrical power across public land to the Disposal Facility on private land near Cheney Reservoir. The need for the action is established by the BLM's responsibilities under the Federal Land Policy and Management Act (FLPMA) to respond to AES' and GVP's requests for ROW Grants and a short-term ROW authorizing use on public land for access and utilities. In order to issue ROW Grants, the actions would need to be consistent with other existing authorized activities in the Project Area. If granted, the actions would include development of appropriate project design and mitigation that would be consistent with the goals, objectives, and decisions of the Grand Junction Resource Area Resource Management Plan (RMP – BLM, 1987), as well as with other applicable federal, state, and county policies, regulations, and laws. The Proposed Action is consistent with FLPMA, which reiterates that the 1970 Mining and Minerals Policy Act shall be implemented and directs that public lands be managed in a manner which recognizes the need for domestic sources of minerals and other resources.

Map 1.2-1

General Location of the Indian Mesa Disposal Facility Access Project



No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by the BLM

1.4 PLAN CONFORMANCE REVIEW

PLAN CONFORMANCE REVIEW: The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 CFR §1610.5, BLM 1617.3):

Name of Plan: GRAND JUNCTION Resource Management Plan

Date Approved: JANUARY, 1987

Decision Number/Page: Page 2-29.

Decision Language: To respond in a timely manner to requests for utility authorizations on public land while considering environmental, social, economic, and interagency concerns.

Policies for development and land use decisions are currently contained in the Grand Junction Resource Area (now referred to as the GJFO) RMP and Record of Decision (ROD) dated January 1987 (BLM, 1987). Management activities and development projects selected and approved must be in conformance with the RMP. According to the details summarized below, the BLM has determined that the Proposed Action would comply with management objectives in the BLM GJFO.

The GJFO RMP states that use of existing corridors or upgrading of facilities in sensitive and suitable zones is a management action (BLM, 1987). An objective of the RMP for public utilities management is for the BLM “to respond, in a timely manner, to requests for utility authorizations on public land while considering environmental, social, economic, and interagency concerns” (BLM, 1987). This same objective can be applied to road and power line right-of-way requests, as well.

In January 1997, the Colorado State Office of the BLM approved the Standards for Public Land Health and amended all RMPs in the State. Standards describe the conditions needed to sustain public land health and apply to all uses of public lands.

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form and geologic processes.

Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods.

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat’s potential.

Standard 4: Special status, threatened and endangered species (federal and state) and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Standard 5: The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado.

Because standards exist for each of these five categories, a finding must be made for each of them in an environmental analysis. These findings are located in this document.

1.5 AUTHORIZING ACTIONS

BLM is not the only agency that must issue approvals for the Project. A list of permits, approvals, and authorizing actions is provided, but not limited to those shown below in Table 1.5-1.

**Table 1.5-1
Permits, Approvals, and Authorizations ¹**

Issuing Agency	Permit Name or Approval	Nature of Permit/Approval
Bureau of Land Management	Right-of-Way Grant Short-term Right-of-Way	Allows activity on federal land
	Antiquities, Cultural, and Historic Resource Permits	Issue antiquities and cultural resources use permits to inventory, excavate, or remove cultural or historic resources from federal lands
Department of Energy	Approval for co-use of ROW	Agreement on co-use of existing road and utility ROW
Grand Valley Power	Approval for co-use of ROW	Agreement on co-use of existing utility ROW
Colorado State Historic Preservation Office	Concurrence	Cultural resource protection
U.S. Fish and Wildlife Service	ESA Section 7 Consultation	Biological Opinion
Colorado Department of Transportation	State Highway Access Permit	Access
Corps of Engineers	Section 404 Nationwide or Individual Permit	Authorization to discharge to Waters of the U.S.
CDPHE ² – Water Quality Control Division	General Construction Stormwater NPDES ³ Permit	Controls off-site stormwater runoff from construction activities
CDPHE ² – Water Quality Control Division	Industrial Stormwater NPDES ³ Permit	Controls off-site stormwater from industrial facilities
CDPHE ² – Air Pollution Control Division	Air Quality Permit-to Construct	Regulates emissions from storage tanks
CDPHE ² – Water Quality Control Division	General Permit for Commercial Disposal Facility	Regulation for Commercial Disposal Facility with a Certificate of Designation from the local county
Mesa County	Conditional Use Permit Modification	Permit to construct and operate facility
¹ This list is intended to provide an overview of key regulatory requirements that would govern project implementation. Additional approvals, permits, and authorizing actions could be necessary. ² CDPHE – Colorado Department of Public Health and Environment. ³ NPDES – National Pollutant Discharge Elimination System.		

1.6 PUBLIC PARTICIPATION

Scoping is the process by which the BLM solicits internal and external input on the issues, impacts, and potential alternatives that will be addressed, along with the extent to which those issues and impacts will be analyzed in a NEPA document. Internal scoping is the use of BLM and cooperating agency staff to help determine what needs to be analyzed in a NEPA document. External scoping involves notification and opportunities for feedback from other agencies, organizations, tribes, local governments, and the public. NEPA regulations (40 CFR §1500-1508) do not require external scoping for an EA, and the BLM decided to internally scope the Proposed Action. The Project was reviewed by resource specialists in August 2014, and posted to the GJFO website under internal scoping.

1.7 DECISION TO BE MADE

BLM decision-makers will decide whether or not to grant the requested ROWs based on the analysis contained in this EA. The BLM may choose to: a) accept the Project as proposed, b) accept the Project with modifications, c) modify the Proposed Action by incorporating reasonable alternatives, or d) deny the applications. The Decision Record associated with this EA may not constitute the final approval for the Proposed Action. It provides the BLM Authorized Officer (AO) with an analysis from which to base the final approval for the proposed ROWs.

CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The purpose of this chapter is to describe the Proposed Action, including the non-federal connected action. The No Action Alternative is also discussed in this chapter. No alternatives to the Proposed Action have been identified.

2.2 ALTERNATIVES ANALYZED IN DETAIL

2.2.1 Proposed Action

2.2.1.1 Description

As discussed above, AES and GVP have requested rights-of-way on BLM-administered lands for access and power to a Disposal Facility, which is located on private land (see Section 1.1). The proposed Disposal Facility site is located west of the existing DOE Cheney Site. Map 2.2-1 identifies the location of the proposed Disposal Facility in relation to U.S. Highway 50 and the DOE Cheney Site. The existing DOE Cheney Site is accessed from U.S. Highway 50 by approximately 1.5 miles of paved two-lane road (DOE Access Road) located within an existing 300-foot BLM ROW (COC-043106). The DOE ROW also contains a 7.2-kilovolt (kV) overhead power line within a 20-foot ROW, owned by GVP (COC-050800) which serves the DOE Cheney Site. The existing DOE Access Road and power line parallel the proposed Disposal Facility 530 feet north of the private parcel boundary. AES' ROW application requests a separate ROW for 5,110 feet (30 foot width) coinciding with DOE's ROW for partial access to the Disposal Facility.

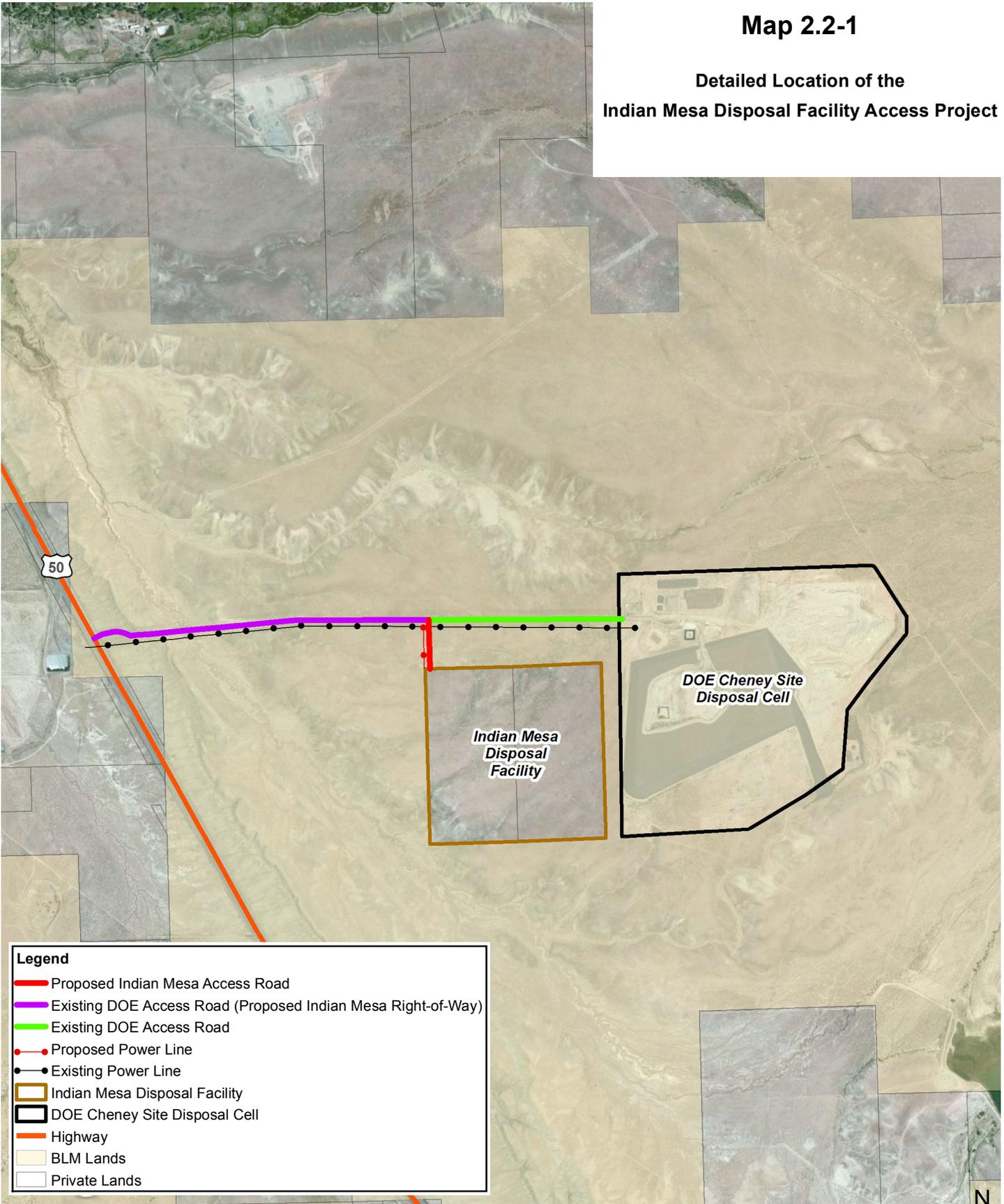
AES is also requesting a 730-foot (40 feet wide for 60 feet and 30 feet wide for 690 feet) ROW for the proposed Indian Mesa Access Road from the existing DOE Access Road to the Disposal Facility across BLM-administered lands (see Map 2.2-2). GVP applied for a 621-foot long (20-foot wide) right-of-way to construct a 12.5 kV power line which would intersect with the existing GVP power line to provide electrical service to the Disposal Facility. The power line would parallel the proposed Indian Mesa Access Road to the Disposal Facility. Additionally, AES proposes a 5-foot wide short-term ROW on either side of the road ROW (736 feet on the west side and 728 feet on the east side) for construction; 5 feet of the GVP ROW overlaps the short-term ROW. Map 2.2-2 provides detail of the proposed Indian Mesa Access Road and power line ROWs.

The proposed Disposal Facility on private lands may include:

- Lined evaporation ponds to treat oil and gas exploration liquid waste;
- A land-farm to treat drilling sludge, sand and grease trap sludge, and other petroleum impacted soils;
- A landfill for disposal of oil and gas exploration and production solid wastes from drilling operations and petroleum contaminated soils; septic tank sludge; cooking grease; municipal wastewater treatment plant sludge; and any other wastes AES is authorized to receive, having obtained the applicable State and County approvals;
- Management facilities including an off-loading area; and
- Stormwater retention pond to contain runoff on the site with no off-site discharge.

Map 2.2-1

Detailed Location of the Indian Mesa Disposal Facility Access Project



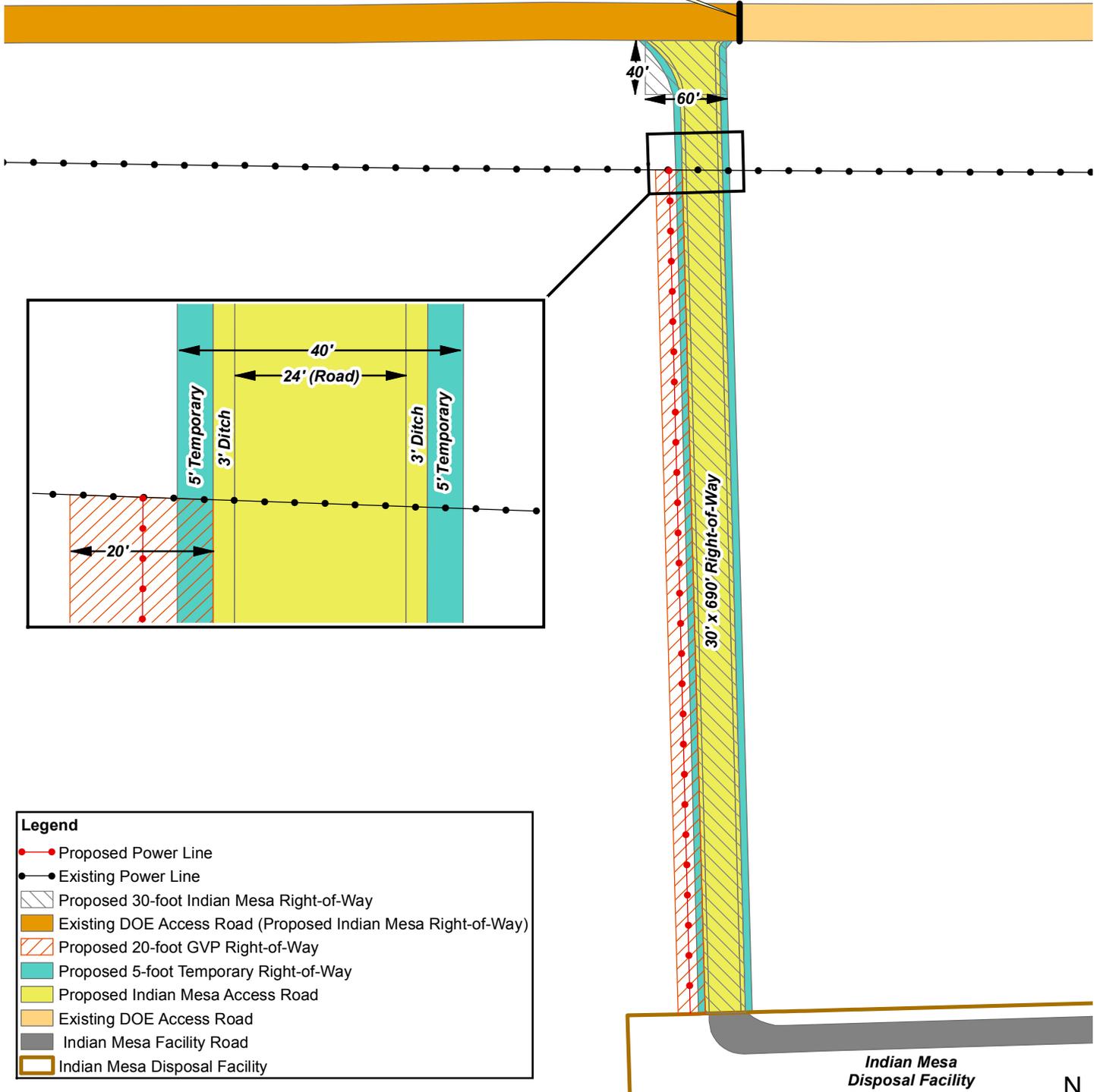
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Map 2.2-2

Indian Mesa Rights-of-Ways

East end of 30' x 5,110' Proposed Indian Mesa Right-of-Way
Co-located with Existing DOE Access Road Right-of-Way
and New Gate Location



- Legend**
- Proposed Power Line
 - Existing Power Line
 - ▨ Proposed 30-foot Indian Mesa Right-of-Way
 - Existing DOE Access Road (Proposed Indian Mesa Right-of-Way)
 - ▨ Proposed 20-foot GVP Right-of-Way
 - Proposed 5-foot Temporary Right-of-Way
 - Proposed Indian Mesa Access Road
 - Existing DOE Access Road
 - Indian Mesa Facility Road
 - Indian Mesa Disposal Facility



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2.2.1.2 Project Components and Land Requirements

Existing DOE Access Road. The DOE Access Road was constructed as a temporary haul road and long-term minimum-use service road for DOE operations. In the summer of 2012, subsequent to a report prepared by Huddleston-Berry Engineering recommending an increase in asphalt paving thickness based on AES' proposed track traffic, DOE made significant upgrades to the road. Based on those upgrades, no disturbance would occur to the DOE Access Road. If necessary, another analysis may be conducted after the facility is placed in service.

Proposed Indian Mesa Access Road. The Indian Mesa Access Road would extend from the existing DOE Access Road to the northwest corner of the Disposal Facility boundary and would consist of a 24-foot two-lane gravel surface with 3-foot ditches on each side. Five feet on either side of the road would be used during construction and immediately reclaimed after construction (see Map 2.2-2). The proposed Indian Mesa Access Road would occur within relatively flat topography; therefore, cuts and fills would be small and backslopes would be 3 to 1 or less. Construction of the 730-foot Indian Mesa Access Road would disturb approximately 0.70 acre over the short-term. Approximately 0.53 acre of permanent disturbance (road surface and 3-foot shoulders) would remain after road construction and would continue to be disturbed for the life of the Disposal Facility (see Table 2.2-1).

AES would install a security gate (comparable to DOE's existing U.S. Highway 50 gate) 75 feet east of the turnoff to AES' property access turnout. The gate would connect to the existing north and south right-of-way fence with new fencing. The new fence would match the existing fence on the north and south side of the right-of-way. No new surface disturbance would occur as a result of gate installation.

Proposed Power Line. The power line would be approximately 1,000 feet in length, of which 631 feet would be located across BLM-administered land. Five wood poles would be required to support the power line (three on BLM-administered land and two on private land), and approximately 4,000 feet of total conductor wire would be necessary (approximately 2,500 feet across BLM-administered lands). Construction of the power line would disturb approximately 0.22 acre.

After construction of the Indian Mesa Access Road and power line, approximately 0.17 acre within the 5-foot short-term right-of-way either side of the Indian Mesa Access Road would be reclaimed and revegetated within one growing season after construction with BLM-recommended seed mix. Table 2.2-1 provides estimates for temporary and permanent surface disturbance associated with construction and operation.

**Table 2.2-1
Estimated Surface Disturbance and Rights-of-Way for Proposed Action**

Component	Total Surface Disturbance (acres)	Short-Term Surface Disturbance (acres)	Long-Term Surface Disturbance (acres)	Permanent Right-of-Way (acres)	Short-Term Right-of-Way (acres)
DOE Access Road	0.00	0.00	0.00	3.52	0.00
Indian Mesa Access Road	0.70	0.17	0.53	0.53	0.17
GVP Power Line	0.22 ¹	0.22 ¹	0.00	0.29	0.00
Total	0.92	0.39	0.53		

¹ Five feet of the 20-foot disturbance width for the power line coincides with the temporary disturbance for the access road; 0.07 acre is included in the Indian Mesa Access Road disturbance.

Disposal Facility on Private Land. The proposed Disposal Facility would treat oil and gas exploration and production non-hazardous water and non-hazardous solids from the Piceance Basin, including Mesa, Garfield, and Rio Blanco counties and may include: 1) an off-loading facility (approximately 2.5 acres); 2) up to 14 evaporation ponds (approximately 3 acres in size, each; approximately 36 acres total); 3) a land-farm (approximately 7 acres); 4) a landfill (approximately 53 acres); and 5) a stormwater retention pond (approximately 3 acres). Internal connector roads would also be constructed. Approximately 113 acres may be disturbed. The site would be permitted under all applicable federal, state, and local regulations and operated in accordance with current best management practices. Disturbance in the vicinity of the seeps and steeper topography in the southwest corner is not proposed.

2.2.1.3 Schedule and Workforce

Construction of the Indian Mesa Access Road, power lines, and the Disposal Facility would occur after all permits and approvals are obtained.

Indian Mesa Access and Power Line

AES estimates that construction of the Indian Mesa Access Road and the power line would take approximately 2 weeks. After construction, all temporarily disturbed areas would be returned to pre-construction conditions and a stable vegetative cover would be maintained. Reclamation would be monitored and is expected to be successful 3 years after road and power line construction is complete.

Construction of the access road and power line would require an average workforce of 10 to 20 workers per day. All workers would be hired locally. It is not expected that additional staffing beyond what is identified for the Disposal Facility would be required to maintain the DOE Access Road or Indian Mesa Access Road after construction.

Disposal Facility

It is estimated that construction of the first phase of the Disposal Facility (i.e., roads, unloading area, initial evaporation ponds and/or landfill segment) would require approximately 3 months. Additional ponds and landfill segments would be constructed on an as-needed basis.

Construction of the first phase would require 10 to 20 workers. All workers would be expected to be hired locally. The Disposal Facility would be open 24 hours per day, 7 days per week, or as need dictates. During operations, the Disposal Facility would be staffed during operating hours. The number of staff at any time would be variable depending on the volume of use at the facility, but would consist of at least 2 to 6 full-time employees. The Disposal Facility would continue operation for as long as a need exists, with an anticipated minimum of 30 years.

2.2.1.4 Access

The major highway used for access would be U.S. Highway 50. It is expected that approximately 95 percent of all traffic would be to/from the north and west (Whitewater). Traffic would exit U.S. Highway 50 at a location that has a median opening, and turn onto the existing DOE Access Road.

2.2.1.5 Traffic

Indian Mesa Access and Power Line

Traffic associated with construction of the Indian Mesa Access Road and power line would include approximately five light-vehicles for construction workers. Also, heavy equipment required for construction of the access road would be transported via the existing DOE Access Road and the proposed Indian Mesa Access Road on BLM-administered land to adjacent

private land where it would be off-loaded. Dust control during construction of the access road would require up to two heavy-vehicle round trips per day depending on site conditions.

Disposal Facility

AES estimates that during the 3-month construction period for the first phase of the Disposal Facility on private land, traffic on the Indian Mesa Access Road (and existing DOE Access Road) would be 20 vehicle round trips per day, most of which would be heavy vehicles. During operation of the Disposal Facility, it is anticipated that between two and six light vehicles would be required to transport workers, and between 20 and 50 trucks (combination of both tandem and tractor/trailer) would transport waste to the Disposal Facility daily.

2.2.1.6 Site Specific Resource Surveys

Cultural Surveys. A Class III (intensive) cultural resources inventory was conducted in March 2010 and May 2013 by Grand River Institute (GRI) under BLM Antiquities Permit No. C-52775 (Conner et al., 2013; Conner, 2010). The inventory consisted of a 4.0-acre block located on BLM-administered lands for proposed Indian Mesa Road, and a 160-acre block on private lands for the construction of the Disposal Facility located on private lands. The survey reports were provided to the BLM GJFO.

Biological Surveys. WestWater Engineering conducted surveys and/or identified potential habitat in April and May 2014 for the following biological resources within the Project Area (BLM-administered land and private land): 1) federally-listed and BLM-sensitive botanical species; 2) nesting raptors; 3) BLM-sensitive animal species; 4) Birds of Conservation Concern (BCC) occurrences; 5) noxious and invasive weed species; and 6) potential U.S. Army Corps of Engineers (COE) Waters of the U.S (WoUS), including wetland areas. Biological surveys were not conducted along the existing DOE Access Road. BLM-sensitive and federally-listed botanical species were surveyed within a 100-meter buffer of proposed surface disturbance on BLM-administered lands and the Disposal Facility on private lands. Visual searches using binoculars and/or spotting scopes for raptors were conducted within 0.25 mile and 0.5 mile of project features within woodland and cliff habitat, respectively. Surveys for burrowing owl followed the Colorado Parks and Wildlife's (CPW) Burrowing Owl protocol within 0.25 mile of proposed disturbance in prairie dog colonies (see Colorado Division of Wildlife -CDOW, 2007a). Noxious weeds were also surveyed within 100 meters of proposed disturbance on BLM-administered lands and the Disposal Facility boundary on private lands, greater than the 30 meter recommendation. Potential COE jurisdictional areas were recorded when encountered along proposed disturbance. During all survey efforts, BLM-sensitive wildlife species and/or sign were documented. Surveys were conducted according to current BLM GJFO protocols (see Appendix A).

2.2.1.7 Operation and Maintenance

AES would utilize the existing DOE Access Road and Indian Mesa Access Road 24 hours/day, 7 days per week for as long as there is a need for the facility. If damage occurs to the access roads, repair would occur immediately, with resurfacing as conditions and wear dictate. Disposal Facility equipment would be used to remove and control snow on roadways as needed. Any accidents or spills associated with waste transporters or facility operations would be reported and mitigated by environmental cleanup contractors.

2.2.1.8 Construction Techniques

Proposed Indian Mesa Access Road. The road would be constructed according to Gold Book (BLM and Forest Service, 2007) standards and in accordance with BLM Manual Section 9113

for typical road construction by an experienced road construction company. Standard road construction techniques would include: preconstruction survey, equipment mobilization, clearing, grading, and installation of Best Management Practices (BMPs) for erosion control, road surfacing, cleanup, and restoration.

The construction techniques described below would be used unless site-specific conditions warrant special methods.

Pre-construction Survey. Construction staking is required to designate the centerline and outside right-of-way boundaries. Prior to construction, the roadway and power line alignment from the existing DOE Access Road to the proposed Disposal Facility would be clearly marked/staked. Cut/fill staking and culvert location would also be surveyed and placed. Flagging, signs, and other markings identifying the limits of disturbance would be maintained through construction. A survey crew would be available during construction activities to refresh any damaged stakes.

Mobilization. Construction equipment associated with road construction would be transported via tractor trailer and stored within the Disposal Facility boundary.

Clearing and Grading. Vegetation would be cleared and the ROW would be graded to contours that complement the natural terrain as well as allow for proper surface water run-off. Cleared vegetation and excavated rocks/boulders would be hauled to and stockpiled at the Disposal Facility on adjacent private land and composted as green waste when the Disposal Facility becomes operational. Topsoil would be salvaged and stored temporarily within the Disposal Facility property on private lands to be used to facilitate revegetation of the short-term right-of-way after access road construction is complete. Ground disturbance would be limited to approved, staked areas.

Installation of Erosion Control BMPs. Erosion control BMPs would be installed immediately after clearing. Placement of erosion control BMPs would be according to AES' Stormwater Management Plan. All erosion control BMPs would be routinely inspected and any damaged or temporarily removed structures would be replaced at the end of each working day.

Road Surfacing and Culvert Installation. The roadway would be founded on 12 inches recompacted native material, and 6 inches of Class 6 base course would be placed and compacted over the native material. Finally, a 4-inch overlay of ¾-inch washed gravel would be placed to serve as the roadway travel surface. Shoulders, borrow ditches, and surface flow drainage infrastructure would be constructed concurrently with the roadway. The Disposal Facility property would be utilized for any overburden or borrow areas required during construction.

A 12-inch culvert would be placed approximately at the midpoint of the proposed Indian Mesa Access Road alignment. The culvert, in conjunction with the eastern borrow ditch would direct existing stormwater runoff under the road for discharge into a historic flow channel along the road's western boundary.

All dirt moving activities would be moisture conditioned with import water from existing water rights to control dust and optimize compaction. Road surface material and gravel structural fill would be imported from off-site commercial suppliers; no sand or gravel would be obtained from BLM-administered lands. All staging and stockpile areas would be confined to the private land within the Disposal Facility boundary.

Cleanup and Restoration. Cleanup and restoration would occur after the access road is constructed. Cleanup of the surface along the ROW (road base and ditches) and temporary use areas would be performed by removing construction debris and by grading to the finished contour. Permanent erosion control measures would be installed and seeding would occur within the short-term ROW on each side of the road to stabilize exposed soils and reduce sediment loss, reduce the growth of noxious weeds, reduce maintenance costs, maintain scenic quality and forage, and protect habitat. All disturbed areas outside of the roadway travel surface would be revegetated and seeded with native grass. Areas would be reclaimed.

Power Line. Construction of the power line would be subcontracted to a licensed electrical contractor after consultation with GVP. All work would be performed within the 20-foot ROW and the 40-foot ROWs for the Indian Mesa Access Road. Construction of the power line would comply with “Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006” and with GVP’s Avian Protection Plan, which is submitted with the U.S. Fish and Wildlife Service (FWS) (Avian Power Line Interaction Committee, 2006).

Disposal Facility. Under the Mesa County Conditional Use Permits, AES would comply with the nighttime light pollution requirements in Section 7.6.7 of the Code. Air emissions for the facility would be regulated under an air quality permit issued by the CDPHE. Wild-life friendly fencing would be erected to control wildlife ingress around the perimeter of the Disposal Facility. All work areas and components would be fully lined with leak detection monitoring to avoid subsurface discharge and off-site migration of any contaminants. Internal maintenance roads would be gravel-surfaced and dust would be controlled by water. Storm-water runoff/runoff would be contained in all work areas and collected in an on-site storm-water retention pond for evaporation with no off-site discharge.

Evaporation Ponds. Up to 14 produced water evaporation ponds would be constructed on private land. Each pond would be approximately 3 acres in size and approximately 8 feet deep. Evaporation ponds would have an interior slope of 3 horizontal to 1 vertical and a maximum exterior slope of 3 horizontal to 1 vertical. The bottom of each pond would be sloped at approximately 0.2 percent grade to a gravel sump with inspection ports. Each pond would be double-lined in accordance with the Colorado Solid Waste Regulations Section 17.3.1(A)(3). The system would consist of a 60-mil high density polyethylene (HDPE) primary liner, a synthetic drainage blanket leak detection system with a sump, and a 40-mil secondary HDPE liner. Containment berms would be constructed around each pond, and, as required, the water level would be at least 2 feet from the spill point (i.e., the top of the berm). Evaporation ponds would be constructed when temperatures are in excess of 40 degrees for proper HDPE liner installation.

Load-out Facility. The load-out facility would be constructed on the northwestern corner of the private land at the end of the Indian Mesa Access Road. Standard techniques would be employed during construction in accordance with the CUP issued by Mesa County and the permit for the Disposal Facility issued by CDPHE.

Land-farm. This facility may consist of three compacted clay pads: 1) compost storage pad, 2) work pad for composting material, and 3) airing petroleum contaminated soil. Runoff from the pads would be collected in four lined stormwater retention basins. This section would also have an office and shop area.

Landfill. The landfill would be double-lined on the bottom and would have a water balance cap. It would be designed to be “soil balanced” and would be constructed in phases to minimize the amount of disturbed area and to adjust to volume demands of the industry. Space would be provided to dispose of petroleum contaminated soils produced from drilling.

2.2.1.9 Project Design Features

Fueling and Hazardous Materials. Fuels and hazardous materials would not be stored along the right-of-way.

Fire Control. AES would comply with all federal, state, and local laws, ordinances, and regulations that pertain to the prevention, pre-suppression, and suppression of fires. If wildfires are observed outside of the Project Area, they would be reported immediately to the nearest fire dispatch office (Lands End Fire Department).

Dust Control. Dust suppression techniques would be used during construction of the access road and power line, as well as during construction of the Disposal Facility. Dust would be controlled through water sprinkling on gravel-surfaced maintenance roads within the Disposal Facility. Water for dust control would be obtained from a municipal source.

To minimize dust transferred to the existing DOE Access Road, AES would install a vehicle tracking pad at the entrance/exit to the Disposal Facility that would remove soils from construction vehicle tires prior to exiting the facility. Sediment tracked onto the paved access roads would be removed through the use of a street sweeper.

Erosion Control. Temporary erosion controls would be installed immediately after initial disturbance (clearing) and would be properly maintained throughout construction and reinstalled as necessary until replaced by permanent erosion controls or restoration is complete. These measures may include but are not limited to sediment barriers, slope breakers, mulch, and erosion control fabric. AES would follow their Stormwater Management Plan(s) prepared in accordance with CDPHE regulations for implementation of the BMPs.

2.2.1.10 Reclamation

After construction of the Indian Mesa Access Road and power line, all temporarily disturbed areas would be returned to pre-construction conditions and a stable vegetative cover would be maintained. The disturbed area would be restored and revegetated with a seed mix approved by the BLM AO. Reclamation would be monitored and is expected to be successful 3 years after road and power line construction is completed.

2.2.1.11 Abandonment

At the end of operations for the Indian Mesa Disposal Facility, AES would notify the BLM GJFO of the proposed closure date at least 60 days prior to closure.

Access and Power Line

At the time of the Indian Mesa Disposal Facility closure, the Indian Mesa Access Road and power line would either be removed and restored to preconstruction conditions according to BLM GJFO specifications, or renegotiated with the BLM GJFO to provide access to the private property for private use and long-term compliance monitoring activities associated with the facility closure. Improvements made to the existing DOE Access Road would remain and continued maintenance would be provided by DOE.

Disposal Facility

Final abandonment of the Disposal Facility on private lands would be according to CDPHE specifications. Closure would consist of removing the treatment system components; infrastructure such as fencing, internal roadways, buildings, and associated utilities would

remain for appropriate future uses. Treatment sites would be graded to former contours, disturbed areas would be reseeded with native drought- and salt-resistant vegetation.

Post-closure care would consist of long-term monitoring of the closed facility to assure no remaining contaminants are transported off-site. Monitoring would include periodic inspection and maintenance of revegetated areas for a period of 5 years to ensure that the revegetation effort is successful. Continued monitoring and sampling of groundwater would continue for a period of 5 years.

2.2.2 No Action Alternative

In accordance with the NEPA and CEQ regulations, which require that a No Action Alternative be presented in all environmental analyses in order to serve as a “baseline” or “benchmark” from which to compare all proposed “action” alternatives, a No Action Alternative is analyzed in this EA. Under this Alternative, BLM would deny AES’ and GVP’s applications for ROWs on BLM-administered lands. The Indian Mesa Access Road and power line would not be built on BLM-administered lands. The DOE Access Road would continue to be use to access the DOE Cheney Site.

CHAPTER 3 - AFFECTED ENVIRONMENT AND EFFECTS

3.1 INTRODUCTION

This section provides a description of the human and natural environmental resources that could be affected by the Proposed Action, including the Connected Action proposed on private lands, and presents comparative analyses of the direct, indirect, and cumulative effects on the affected environment stemming from the implementation of the actions under the Proposed Action. This includes information compiled in the Grand Junction Resource Area RMP (BLM, 1987). Table 3.1-1 provides a list of potentially impacted resources which are analyzed in this EA.

**Table 3.1-1
Potentially Impacted Resources**

Resources	Not Present on Location	No Impact	Potentially Impacted
PHYSICAL RESOURCES			
Air and Climate			X
Geological	X		
Mineral Resources	X		
Soils			X
Water (surface, groundwater, wetland/riparian zones, and floodplains)			X
Noise			X
BIOLOGICAL RESOURCES			
Invasive, Non-native Species			X
Vegetation			X
Threatened or Endangered Species & Sensitive Species			X
Migratory Birds			X
Wildlife			X
HERITAGE RESOURCES AND HUMAN ENVIRONMENT			
Cultural or Historical			X
Paleontological			X
Tribal & Native American Religious Concerns			X
Visual Resources		X	
Socioeconomics			X
Environmental Justice			X
Transportation and Access			X
Wastes, Hazardous or Solid			X
LAND RESOURCES			
Prime or Unique Farmlands	X		
Recreation	X		
Special Designations (ACEC, SMAs, etc.)	X		
Wild and Scenic Rivers	X		
Wilderness	X		
Range Management			X
Fire and Fuels			X
Wild Horse and Burros	X		
Land Tenure, ROW, Other Uses			X

3.1.1 Resources – Not Present on Location or No Impact

The resources identified as not present or not affected in Table 3.1-1 will not be brought forward for additional analysis based on the following:

- *Geological Resources.* No known unique geological resources occur in the Project Area.
- *Mineral Resources.* Based on the limited depth of disturbance associated with the Project, mineral resources would not be affected.
- *Visual Resources.* The Proposed Action lies on unclassified lands under the Visual Resource Management (VRM) system in the 1987 RMP, with the exception of the area immediately surrounding Indian Creek, which is provided a VRM Class III. The new access road and overhead power line on BLM-administered lands and proposed Disposal Facility on private lands would be adjacent to the existing paved DOE Access Road and the existing DOE Cheney Site. Disturbance from the Project would not be different than what is currently present on the landscape. No continuous night lighting would occur at the disposal facility. Lights would be turned on as trucks arrive in the early evening hours but would be turned off when trucks leave. All lights would be down-directed. This would only occur in the winter months when there are less hours of daylight.
- *Prime or Unique Farmlands.* No prime or unique farmlands occur in the Project Area.
- *Recreation.* BLM-administered lands within the Project Area are not designated as recreation management areas under the 1987 RMP. There is no public access along the DOE Access Road (locked gate) and therefore, the public does not recreate in the area.
- *Special Designations.* There are no areas of special designations in the vicinity of the Proposed Action. The closest area of special designation is the Dominguez-Escalante NCA, its border lying a few miles west of the Project Area. NCAs are designated by congress to conserve, protect, enhance, and manage select public lands for the benefit and enjoyment of present and future generations. The 209,610-acre Dominguez-Escalante NCA contains petroglyphs, waterfalls, and highly scenic sandstone canyons and cliffs. It also includes a 66,000-acre wilderness area. Approximately 100,000 people visit the Dominguez-Escalante NCA each year. Bridgeport Road, which is a major access road to the NCA via U.S. Highway 50, is about three miles south of the Project Area. The Northern Branch of the Old Spanish National Historic Trail's (OST) officially designated route is just west of the project area on the west side of U.S. Highway 50. A viewshed Geographic Information Systems Analysis was performed by the BLM to ascertain if the project would be visible from the congressional alignment of the OST. From the OST the 160 acre disposal area and ROW to the disposal area would not be visible.
- *Wild and Scenic Rivers.* No designated Wild and Scenic Rivers occur in the Project Area.
- *Wilderness.* No wilderness, wilderness study areas, or lands with wilderness characteristics occur within the Project Area. The closest wilderness area is Dominguez Canyon, which is approximately 3.6 miles southwest of proposed Project disturbance and separated by U.S. Highway 50 and the Gunnison River. The nearest wilderness study area is Adobe Badlands, located about 10 miles southeast of proposed project disturbance and managed by the BLM Uncompahgre Field Office.
- *Wild Horse and Burros.* No wild horse and burro management or herd areas occur within the Project Area.

3.1.2 Resources – Potentially Impacted

Within each resource type potentially impacted, when applicable, definitions of the kinds of impacts are included in the evaluation of potential environmental impacts. Comparison of impacts is intended to provide an impartial assessment to help inform the decision-maker and the public. The impact analysis does not imply or assign a value or numerical ranking to impacts. Actions resulting in adverse impacts to one resource might impart a beneficial impact to other resources. In general, adverse impacts described in this chapter are considered important if they result from, or relate to, the implementation of any of the alternatives. These impacts are defined as follows:

- **direct impacts** – impacts that are caused by the action, and that occur at the same time and in the same general location as the action.
- **indirect impacts** – impacts that occur at a different time or in a different location than the action to which the impacts are related.
- **short or long-term impacts** – When applicable, the short-term or long-term aspects of impacts are described. For the purposes of this EA, short-term impacts occur during or after the activity or action and might continue for up to 2 years. Long-term impacts occur beyond the first 2 years.
- **cumulative impacts** – Cumulative effects are defined in the CEQ regulations (40 CFR 1508.7) as “...the impact on the environment that results from the incremental impact of the action when added to other past, present and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.” Cumulative effects are analyzed in Chapter 4.

Environmental impact analysis is based upon available data and literature from state and federal agencies, peer-review scientific literature and resource studies conducted in the Project Area.

3.2 PHYSICAL RESOURCES

3.2.1 Air Quality and Climate

3.2.1.1 Current Conditions

Regional air quality is influenced by a combination of factors including climate, meteorology, the magnitude and spatial distribution of local and regional air pollution sources, and the chemical properties of emitted pollutants. Within the lower atmosphere, regional and local scale air masses interact with regional topography to influence atmospheric dispersion and transport of pollutants. The following sections summarize the climatic conditions and existing air quality within the Project Area and surrounding region.

The Project Area is located in a semiarid (dry and cold), mid-continental climate regime. The area is typified by dry, sunny days, clear nights, and large daily temperature changes. The climate and topography of the region are very conducive to the formation of temperature inversions. The nearest long-term meteorological measurements were collected at Palisade, Colorado (1911-present), located approximately 13 miles north of the Project Area at an elevation of 4,800 feet above mean sea level - amsl (Western Regional Climate Center - WRCC 2013).

The annual average total precipitation at Palisade is 9.88 inches, with annual totals ranging from 19.37 inches (1983) to 4.68 inches (1956). Precipitation is fairly consistent throughout the year with average monthly precipitation ranging from 0.54 inches (January) to 1.21 inches

(September). An average of 14.0 inches of snow falls during the year (annual high 36.7 inches in 1983), with the majority of the snow distributed evenly between November and March.

The region has cool temperatures, with average temperature (in degrees Fahrenheit - °F) ranging between 17.6°F and 39.3°F in January to between 63.5°F and 94.0°F in July. Extreme temperatures have ranged from -23°F (1913) to 111°F (1937). The frost free period generally occurs from early May to mid-October. Table 3.2-1 shows the mean monthly temperature ranges and total precipitation amounts.

**Table 3.2-1
Mean Monthly Temperature Ranges and Total Precipitation Amounts**

Month	Average Temperature Range (°F)	Total Precipitation (inches)
January	17.6 – 39.3	0.54
February	24.7 – 46.7	0.57
March	32.3 – 56.6	0.84
April	40.1 – 66.7	1.03
May	48.6 – 77.0	0.93
June	57.1 – 88.1	0.59
July	63.5 – 94.0	0.69
August	61.4 – 90.9	0.98
September	52.8 – 82.6	1.21
October	41.4 – 69.4	1.17
November	29.9 – 53.3	0.76
December	20.9 – 41.6	0.57
ANNUAL	52.8 (mean)	9.88 (mean)

WRCC, 2013.

Comprehensive wind measurements are collected at Grand Junction located approximately 13 miles northwest of the Project Area. To describe the wind flow pattern for the region, a wind rose for the site, for years 2006 through 2010, is presented in Figure 3.2-1. From this information, it is evident that winds originate from the east to southeast over 40 percent of the time.

The frequency and strength of winds greatly affect the transport and dispersion of air pollutants (see Tables 3.2-2 and 3.2-3). The annual mean wind speed is 7.6 miles per hour (mph), and that relatively high average wind speed indicates the presence of good dispersion and mixing of any potential pollutant emissions resulting from project sources for most hours over the year. Poor dispersion conditions do occur during periods with temperature inversions, which are common to the area.

**Table 3.2-2
Wind Speed Distribution, Grand Junction, Colorado, 2006 - 2010**

Wind Speed (mph)	Frequency (%)
0 – 4.0	23.6
4.0 – 7.5	34.3
7.5 – 12.1	26.6
12.1 – 19.0	12.9
19.0 – 24.7	2.0
Greater than 24.7	0.6

**Table 3.2-3
Wind Direction Frequency Distribution
Grand Junction, Colorado, 2006 - 2010**

Wind Direction	Frequency (%)
N	5.1
NNE	2.7
NE	3.7
ENE	6.4
E	10.9
ESE	16.8
SE	11.1
SSE	6.0
S	3.1
SSW	2.4
SW	2.1
WSW	2.9
W	5.5
WNW	8.1
NW	8.2
NNW	5.1

Air Pollution Concentrations. The U.S. Environmental Protection Agency (EPA) and the States set limits on permissible concentrations of air pollutants. The National Ambient Air Quality Standards (NAAQS) and Colorado Ambient Air Quality Standards (CAAQS) are health-based criteria for the maximum acceptable concentrations of air pollutants at all locations to which the public has access.

Monitoring of air pollutant concentrations has been conducted in the region. These monitoring sites are part of several monitoring networks overseen by state and federal agencies, including: CDPHE, Clean Air Status and Trends Network (CASTNET), Interagency Monitoring of Protected Visual Environments (IMPROVE), and National Acid Deposition Program (NADP) National Trends Network (NTN).

Air pollutants monitored in the region include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter less than 10 microns in effective diameter (PM₁₀), particulate matter less than 2.5 microns in effective diameter (PM_{2.5}), and sulfur dioxide (SO₂). Background concentrations of these pollutants define ambient air concentrations in the region and establish existing compliance with ambient air quality standards. The most representative monitored regional background concentrations available for criteria pollutants as identified by CDPHE are shown in Table 3.2-4.

**Table 3.2-4
Background Ambient Air Quality Concentrations**

Pollutant	Averaging Period	Measured Background Concentration µg/m ³
CO ¹	1-hour	1,145
	8-hour	1,145
NO ₂ ²	1-hour	92.1
	Annual	9.4
PM ₁₀ ³	24-hour	30
	Annual	10
PM _{2.5} ⁴	24-hour	12
	Annual	5
Ozone ⁵	8-hour	145
SO ₂ ⁶	1-hour	31.4
	3-hour	23.5
	24-hour	13.1
	Annual	5.2

¹ American Soda, Parachute 2007-2009, CDPHE.
² Southern Ute, 1 mile NE of Ignacio, 2006-2008, CDPHE.
³ Energy Fuels, 2008-2009, CDPHE.
⁴ Based on S. Ute, 7571 Hwy 5505, 2009-2010, CDPHE.
⁵ Based on CASTNET in Mesa Verde, Canyonlands, and Gothic.
⁶ 1-hour concentration data from Holcim Portland, 2007-2009, other averaging period from Unocal 1983-84 (CDPHE, 2011a).

3.2.1.2 Environmental Consequences

Proposed Action Alternative

Air-pollutant emissions during construction would occur from heavy equipment used to construct the Indian Mesa Access Road and power line over a 2-week period including fugitive dust emissions (PM₁₀ and PM_{2.5}) and vehicle exhaust emissions (NO_x, CO, SO₂, volatile organic carbons - VOCs, PM₁₀, and PM_{2.5}). Effects would be localized and would occur only for the short-term duration of construction. AES would apply water to minimize fugitive dust during construction of the Indian Mesa Access Road and power line. Restricting road construction when winds are in excess of 35 mph would further minimize fugitive dust emissions. Controlling vehicles speeds to 30 mph during construction would further reduce effects to air quality from fugitive dust.

Indirect effects of the Proposed Action would include emissions by vehicles traveling on the access roads once the Disposal Facility becomes operational. Vehicle-related emissions would continue for as long as the Disposal Facility remains operative. As above, effects would be localized and negligible. Emissions associated with construction and maintenance of the Indian Mesa Access Road would not cause or substantially contribute to a violation of any applicable ambient air quality standards. The Proposed Action would comply with all applicable PSD increments. The existing DOE Access Road is paved, so fugitive dust from travel along that stretch of road would be minimal. AES would use a sweeper to remove sediment along the DOE Access Road that would be tracked from the Disposal Facility and Indian Mesa Access Road. Fugitive dust created from vehicle use along the Indian Mesa Access Road would be controlled through water sprinkling.

Increased emissions would occur from construction and operation of the Disposal Facility on private lands. AES would apply water to reduce fugitive dust emissions and would prohibit activities during periods of high winds which would reduce fugitive dust emissions. These actions would not cause or substantially contribute to a violation of any applicable ambient air quality standards. There could be VOC and hazardous air pollutant (HAP) emissions from the Disposal Facility on private lands; however, it would be permitted by CDPHE such that no air quality or health-based standards would be violated.

Protective/Mitigation Measures

The following additional protective/mitigation measure would be required by the BLM to further reduce effects to Air Quality:

- Indian Mesa Access Road construction should not be conducted when winds are in excess of 35 mph. Grand Junction wind data and daily forecasts should be used to check wind data.
- Speed limits should be controlled to 30 mph or less during construction.

No Action Alternative

Under this alternative, there would be no effect to air quality resulting from construction of the proposed Indian Mesa Access Road on BLM-administered land and as a result of construction and operation of the Disposal Facility on private land. The existing DOE Access Road would continue to be used to access the DOE Cheney Site.

3.2.2 Soils (includes a finding on Standard 1)

3.2.2.1 Current Conditions

The access roads, power line, and Disposal Facility would be located on an undeveloped flat, semi-desert plateau with elevations ranging from 5,100 feet to 5,220 feet. Soils in the Project Area were identified and characterized using the Natural Resource Conservation Service (NRCS) Web Soil Survey (NRCS, 2014). According to the NRCS data, one soil type is present within the Project Area: Mapping Unit 47, which consists of the Utaline, Sodic – Uffens Complex, 3 - 12 percent slopes. This mapping unit is located on mesas and is very stony and well-drained. The Utaline, sodic component makes up 45 percent of the map unit. The parent material of this soil consists of colluvium derived from basalt alluvium derived from sandstone and shale over residuum weathered from clayey shale. The depth to a root restrictive layer is greater than 60 inches and there is no zone of water saturation within a depth of 72 inches. The soil map unit is also not flooded or ponded. The Utaline soil has a moderate water erosion hazard and the wind erosion potential is very low. The available water capacity is low and the organic matter content in the surface horizon is about zero percent. The soil has a very slightly saline horizon and a moderately sodic horizon within 30 inches of the soil surface.

The Uffens component makes up 40 percent of the map unit. The parent material of the Uffens soil consists of alluvium derived from sandstone and shale and/or alluvium derived from basalt and/or residuum weathered from clayey shale. Depth to a root restrictive layer is greater than 60 inches and there is no zone of water saturation within a depth of 72 inches. The Uffens soil has a moderate water erosion hazard and the wind erosion potential is low to moderate. The soils available water capacity is moderate and the organic matter content in the surface horizon is about 1 percent. The soil has a moderately saline horizon and a strongly sodic horizon within 30 inches of the soil surface. Table 3.2-5 provides a summary of soil Mapping Unit 47 characteristics and interpretations related to the Proposed Action.

**Table 3.2-5
Soil Mapping Unit Characteristics and Interpretations ¹**

Soil Mapping Unit	Soil Characteristics and Interpretations					
Mapping Unit 47 Utaline, Sodic-Uffens Complex	Land Capability Class ² Prime Farmland	Local Roads and Streets ³	Source of Reclamation Material ⁴	Source of Roadfill Material ⁵	Source of Topsoil Material ⁶	Water Erosion Hazard
Rating	7s Not prime farmland	Very Limited	Poor	Poor	Poor	Moderate
Rating Reason	7s	Large stones	Stone content; carbonate content; sodium content; too alkaline; organic matter content low	Stone and cobble content	Rock fragment; carbonate content; hard to reclaim; too clayey	Moderate slow permeability and runoff potential

¹ Source: NRCS, 2014.

² Land capability classification of 7s means the soils have very severe limitations that make them unsuitable for cultivation and that their use is restricted to mainly grazing or wildlife habitat. The land capability subclass of "s" indicates that the soil is mainly limited because of their shallow, droughty, or stony characteristics.

³ The ratings are based on soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the American Association of State Highway and Transportation Officials - AASHTO - group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

⁴ The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

⁵ The soils are rated as a source of roadfill for low embankments, generally less than 6 feet high. The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread. The ratings are based on the ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

⁶ The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

Public Land Health Standard 1 (Upland Soils)

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form and geologic processes.

Standard 1 is BLM Colorado's Standard and Guideline for Upland Soils: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff. The following are indicators that Standard 1 is being met:

- Expression of rills, soil pedestals is minimal.
- Evidence of actively-eroding gullies (incised channels) is minimal.
- Canopy and ground cover are appropriate.
- There is litter accumulating in place and is not sorted by normal overland water flow.
- There is appropriate organic matter in soil.
- There is diversity of plant species with a variety of root depths.
- Upland swales have vegetation cover or density greater than that of adjacent uplands.
- There are vigorous, desirable plants.

A Land Health Assessment was conducted within the Kannah Creek Common Allotment (BLM, 2010). The Assessment included the Project Area. Within the area evaluated (19,830 acres), upland soils were: 1) not meeting Standard 1 on 26.48 percent of the assessment area (5,250.74 acres), 2) were meeting Standard 1 but with problems on 15.13 percent of the area (3,000.97 acres), and 3) were meeting Standard 1 with no problems on 58.39 percent of the assessment area (11,578.63 acres). The Project Area is on a Stony Saltdesert range site within which the upland soil Standard 1 was being met with problems (BLM, 2010).

3.2.2.2 Environmental Consequences

Proposed Action Alternative

Potential soil effects resulting from construction of the Indian Mesa Access Road and power line include increased soil erosion rates due to loss of vegetation, and soil compaction and damage to soil structure resulting from grading and/or heavy construction equipment. Additional potential effects include the loss or mixing of topsoil through clearing and grading. These potential soil effects can decrease soil productivity and in turn, decrease the reclamation potential of the soil. Soil productivity can also be decreased when noxious weeds invade disturbed areas.

Construction of the Indian Mesa Access Road would disturb a total of 0.70 acre of Utaline, Sodic – Uffens Complex (Mapping Unit 47), of which 0.53 acre would be permanent disturbance associated with graveled road surfaces and shoulders, and 0.17 acre would occur during construction and would be temporary.

Installation of the power line on BLM-administered land would occur from the Indian Mesa Access Road and would disturb an additional 0.22 acre of soil. Additionally, construction and operation of the Disposal Facility could disturb up to 113 acres of soil in Mapping Unit 47 on private land over the life of the operation.

Soil in Mapping Unit 47 has severe limitations that make it difficult to reclaim including: very stony profiles, low available water content (Utaline), and saline and sodic characteristics (see Table 3.2-5). The soil is a poor source of topsoil because of its limiting characteristics (i.e., rock fragments, carbonate and sodium content, hard to reclaim, low organic matter and high clay content). Mapping Unit 47 is rated as a limited source for road and street materials, as well as a

poor source of road fill material because of the large stone and cobble content of the soil (NRCS, 2014). Construction of the Indian Mesa Access Road according to BLM Manual Section 9113 and Gold Book standards (BLM and Forest Service, 2007) would minimize the potential effects to soils. Implementation of BMPs included in the Stormwater Management Plan would prevent erosion.

Protective/Mitigation Measures

The BLM would require the following additional protective/mitigation measures to reduce effects to soils:

- The disturbed temporary construction area should be regraded and revegetated with native seed mixes (as shown below) approved by the BLM GJFO that are certified to be weed-free to promote revegetation and lower erosion hazard potential.

Common Name	Scientific Names	Variety	Season	Form	PLS lbs/acre ¹
Plant Both of the Following (5% Each, 10% Total)					
Fourwing Saltbush	<i>Atriplex canescens</i>			Shrub	1.9
Shadscale	<i>Atriplex confertifolia</i>			Shrub	1.5
and the Following (20% Each, 60% Total)					
Galleta	<i>Pleuraphis [Hilaria] jamesii</i>	Viva florets	Warm	Bunch	2.5
Alkali Sacaton	<i>Sporobolus airoides</i>	Salado	Warm	Bunch	0.2
Western Wheatgrass	<i>Pascopyrum [Agropyron] smithii</i>	Arriba	Cool	Sod-forming	3.6
and Both of the Following (15% Each, 30% Total)					
Indian Ricegrass	<i>Achnatherum [Oryzopsis] hymenoides</i>	Paloma, Rimrock	Cool	Bunch	2.1
Bottlebrush Squirreltail	<i>Elymus elymoides, Sitanion hystrix</i>		Cool	Bunch	1.5
Source: BLM, 2007a. Other adaptable species that could be included or substituted in the seed mix include: Sandberg bluegrass, streambank wheatgrass, thickspike wheatgrass, and scarlet globemallow.					
¹ Based on 45 pure live seeds (PLS) per square foot, drill-seeded. Double this rate (90 PLS per square foot) if broadcast or hydroseeded.					

Recommended Protective/Mitigation Measures

BLM cannot require AES to apply protective/mitigation measures for construction activities proposed on private lands. However, BLM recommends the following measure to minimize effects to soil resources that could occur in the Project Area:

- AES should conduct interim restoration of unused ground during and berm around areas where there is piled soil to minimize erosion and dust.

No Action Alternative

Under this alternative, there would be no effect to soils. Construction of the Indian Mesa Access Road and power line would not occur.

3.2.2.3 Finding on the Public Land Health Standard 1 (Upland Soils)

Standard 1: The Proposed Action could change conditions under Standard 1 in the Project Area if soils became unstable with accelerated erosion and soil loss due to loss of native vegetation cover; however, construction of the Indian Mesa Access Road according to Gold

Book standards and BLM Manual Section 9113 would minimize the potential for unstable soils, erosion, and soil loss.

3.2.3 Hydrology and Water Quality (Surface, Groundwater, and Wetlands and Riparian Zones) (includes findings on Standards 2 and 5)

3.2.3.1 Current Conditions

The Project Area is located within the Indian Creek subwatershed (HUC 140200050704) within the Lower Gunnison River Basin. Indian Creek, an intermittent stream, is the principal drainage in the area, is crossed by the existing DOE Access Road, and is located approximately 360 feet west-southwest of the Disposal Facility boundary. Indian Creek is a tributary to Kannah Creek which flows into the Gunnison River approximately 8 river miles downstream (northwest) from where the DOE Access Road intersects Indian Creek. There is no available streamflow data for Indian Creek, although the USGS National Hydrography Dataset (USGS, 2012) indicates that Indian Creek is intermittent. This corresponds to data collected for similar nearby streams (i.e., Callow Creek) that have minimal flow from March through November and no flow in December, January, and February (USGS, 2014). In addition to Indian Creek, field surveys conducted in May 2014 documented three ephemeral drainages in the Project Area, and two seep areas (see Appendix A). Table 3.2-6 provides a description of these drainages and seeps. No water was evident in any of the drainages or seep areas at the time of surveys.

**Table 3.2-6
Potentially Jurisdictional Waters of the U.S. (WOUS) in the Project Area¹**

Potential WOUS	Project Location	Description
WOUS-1	Crossed by proposed Indian Mesa Access Road.	OHWL not very evident. Approximately 8 inches wide by 1-inch deep; vegetation present below OHWL. No water during survey May 1, 2014.
WOUS-2	Crosses Disposal Facility property for approximately 2,850 feet.	No OHWL. Completely vegetated. Slight depression. No water during survey May 1, 2014.
WOUS-3	Crosses Disposal Facility property for approximately 713 feet.	OHWL approximately 1.5 feet wide by 2-inches deep. No water during survey May 1, 2014.
Seep-1	Southwest corner of Disposal Facility Property.	Area wetted by seep is approximately 0.36 acre. Wetland vegetation present. No water during survey May 1, 2014.
Seep-2	Southwest corner of Disposal Facility Property.	Area wetted by seep is approximately 0.05 acre. Wetland vegetation present. No water during survey May 1, 2014.
Indian Creek	Crossed by existing DOE Access Road; ~360 feet southwest of Disposal Facility property boundary.	Intermittent or ephemeral.

¹ Source: WestWater Engineering (2014) with the exception of Indian Creek (see Appendix A).

A wetland evaluation was also performed during field surveys conducted in 2014 (see Appendix A); two potential wetlands were observed within the southwest corner of the Disposal Facility associated with Seep-1 and Seep-2 (Table 3.2-6). Potential wetlands were based on the vegetation, soils and hydrologic characteristics present at the site in accordance with the 1987

COE Wetlands Delineation Manual and the Arid West Regional Supplement to COE Wetland Delineation Manual, April 2008. No wetland delineations were performed. Wetlands are subject to protection under federal law and Executive Order (EO) 11990, regardless of land ownership.

Riparian areas occur as narrow zones adjacent to drainages and wetland areas. No functioning riparian areas occur in the Project Area (see BLM, 2010). Shrub-dominated riparian zones have been invaded by exotic species, including saltcedar or tamarisk, and Russian knapweed (see Appendix A). Native vegetation that occurs along drainages in the Project Area consists of mat saltbush, shadscale saltbrush, and some greasewood, which are facultative upland species having little association with riparian areas. The presence of these species in close proximity to drainages is often an indicator of decreasing water tables and/or increased compaction and declining riparian health. For example, surveyor field notes indicate WoUS-2 does not exhibit an OHWM and the channel is completely filled in with upland vegetation. Hydrology feeding WoUS-2 has been diverted into Cheney Reservoir during development of the adjacent DOE Cheney Site. An upland determination from the COE would verify this condition. Drainages in the southwest portion of the Disposal Facility property (WoUS-3 and two seeps, see Table 3.2-6) have been invaded by exotic species, including saltcedar or tamarisk, and Russian knapweed (see Appendix A).

Surface Water Quality

Surface water quality depends on natural and anthropogenic factors, including geology, precipitation, vegetation cover and land use. The geology within a watershed is a key determinant of its surface water quality. In areas with outcrops of sandstone, basalt, or granite, the surface water tends to be of good quality. Where the Morrison, Mancos, Wasatch, and Green River formations are exposed, water quality tends to be poorer, with high total dissolved solids and/or selenium concentrations. Selenium derived from marine shales is a leading cause of water quality impairment to surface water in western Colorado. Precipitation patterns also influence water quality. Most rainfall in the Project Area occurs in the form of isolated, short-duration and intense summer thunderstorms, creating localized flood flows that have the power to erode, mobilize and transport sediment downstream. This sediment is then transported to streams and can increase salinity and selenium concentrations in surface water (BLM, 2009a).

The CDPHE Water Quality Control Commission (WQCC) classifies stream segments according to river basin and specific water segments (CDPHE, 2013). All surface waters within Colorado are organized by basin and labeled by stream segment. For each stream segment, the State has set water quality standards for physical, chemical and biological parameters based on the existing or potential beneficial uses for water supply, aquatic life, recreation and agriculture.

The CDPHE, Water Quality Control Division (WQCD) implements and enforces water quality assessments and management policies for surface waters in Colorado. The Integrated Water Quality Monitoring Assessment Report is a bi-annual report that summarizes water quality conditions in the State. According to the current Integrated Report (2012 update to the 2010 305b Report), Indian Creek is within the state-designated Lower Gunnison River Basin, stream segment 4a (CDPHE, 2012). The designated use classifications for this stream segment are Aquatic Life Warm 2, Recreation Class P, Water Supply, and Agriculture. The CDPHE, Water Quality Control Commission (WQCC) Regulation 31 defines these designated uses as follows (CDPHE, 2013):

Class 2 – Cold and Warm Water Aquatic Life. These are waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.

Secondary Contact Recreation P: These surface waters have the potential to be used for primary contact recreation. This classification shall be assigned to water segments for which no use attainability analysis (UAA) has been performed demonstrating that a recreation class N classification is appropriate, if a reasonable level of inquiry has failed to identify any existing primary contact uses of the water segment, or where the conclusion of a UAA is that primary contact uses may potentially occur in the segment, but there are no existing primary contact uses.

Domestic Water Supply. These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent), these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.

Agriculture. These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

The Clean Water Act requires states to compile a list of waterbodies, known as the 303(d) list, that do not fully support their beneficial uses. The 303(d) list and 305(b) report that CDPHE provides to the U.S. Environmental Protection Agency (EPA) under the Clean Water Act identify impaired streams (i.e., those that do not meet water quality standards for the designated uses). According to the current 305(b) Report, Appendix A (2012), Lower Gunnison River segment 4a has an integrated reporting category of 4A, indicating impaired water quality due to high levels of selenium from agricultural sources. The Gunnison River Basin is underlain by Mancos Shale, a marine deposit which contains elevated levels of dissolved selenium. Various activities accelerate the mobilization and transport of selenium from shale and shale derived soil to surface water. Consequently, selenium concentrations in surface waters often exceed the assigned Colorado Water Quality Standards. A Category 4A means the EPA has approved a Total Maximum Daily Load (TMDL) for this impairment which establishes the maximum amount of a pollutant that a water body may receive from various sources and still maintain water quality standards for the assigned beneficial uses (CDPHE, 2011b).

Groundwater Quality

Information on groundwater quality data for the Project Area is not available from the USGS. According to the Colorado Division of Water Resources, the DOE installed numerous groundwater monitoring wells in 1989; however, these wells have been abandoned and the permits with the Colorado Division of Water Resources are no longer active.

Water Rights

According to the Colorado Department of Natural Resource - Division of Water Resources (CDNR-DWR) Water Rights database, there are no water rights within a quarter mile of the Project Area. There are two surface water rights within one mile. One is a ditch in the SWNE quarter of Section 14, permitted to MK-Ferguson and used for industrial purposes. The second is a reservoir right for Stray Doggie Reservoir in the NWSW quarter of Section 11, for domestic use and stock watering. Cheney Reservoir is approximately 1.1 miles southeast of the Disposal Facility boundary, and there is one water right associated with this reservoir (permit number 3626). This right is used for supplemental augmentation (CDNR-DWR, 2014a).

The Colorado Division of Water Resources well permit data indicates there are no active groundwater well permits within one mile of the Proposed Action (CDNR-DWR 2014b).

Floodplains

The 100-year floodplain (areas subject to inundation by the 1-percent-annual-chance flood event) has been mapped by the Federal Emergency Management Agency (FEMA) along Kannah Creek within Mesa County (FEMA, 2012), located approximately 4.0 miles downstream from the Project Area.

Public Land Health Standard 5 (Water Quality)

Standard 5: Standard 5 is BLM Colorado's Standard and Guideline for Water Quality: The water quality of all waterbodies, including groundwater where applicable, located on or influenced by BLM-administered lands will achieve or exceed the Water Quality Standards established by the State of Colorado. Water Quality Standards for surface and groundwaters include the designated beneficial uses, numeric criteria, narrative criteria, and anti-degradation requirements set forth under State law as found in (5 CCR 1002-8), as required by Section 303(c) of the Clean Water Act. The following are indicators that Standard 5 is being met:

- Appropriate populations of macroinvertebrates, vertebrates, and algae are present.
- Surface and groundwaters only contain substances (e.g. sediment, scum, floating debris, odor, heavy metal precipitates on channel substrate) attributable to humans within the amounts, concentrations, or combinations as directed by the Water Quality Standards established by the State of Colorado (5 CCR 1002-8).

Water quality is not meeting Standard 5. Stream Segment 4a of the Lower Gunnison River has an approved TMDL for selenium.

Public Land Health Standard 2 (Riparian Habitat)

Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods. Riparian vegetation captures sediment and provides forage, habitat and biodiversity. As a result, water quality is improved or maintained.

Proper Functioning Condition (PFC) assessments show that the section of Indian Creek closest to the proposed project is not meeting PFC due to water diversions upstream. The creek is diverted into Cheney Reservoir. A Land Health Assessment conducted in the Kannah Creek Common Allotment that coincides with the Project Area concurred that in general, Land Health Standard 2 is not being met. Areas that have been identified with problems are at risk due to poor water infiltration, sheet erosion, poor plant cover and/or bare areas dominated by annuals, and riparian areas not functioning properly.

3.2.3.2 Environmental Consequences

Proposed Action Alternative

Construction in wetlands and drainages could potentially degrade water quality, affect hydrology, and affect wildlife. An evaluation of potential wetlands and drainages was conducted along the proposed Indian Mesa Access Road and power line, and within the Disposal Facility property boundary. A potential jurisdictional drainage (WoUS-1; see Table 3.2-6) was documented along the proposed Indian Mesa Access Road. Little flow was evident in the channel during surveys and considerable vegetation had filled in the drainage. To reduce effects to the intermittent drainage, AES would install a culvert under the Indian Mesa Access Road where the WoUS-1 intersects the road. The culvert, in conjunction with the eastern borrow ditch

would direct existing stormwater runoff under the road for discharge into the historic flow channel along the road's western boundary. Design of the Indian Mesa Access Road according to Gold Book standards and in accordance with BLM Manual Section 9113, as well as implementation of the BMPs in the Stormwater Management Plan would prevent effects to vegetation associated with the intermittent drainage. Additionally, AES should apply for a Nationwide 14 permit from the COE for this crossing.

Indian Creek is crossed by the existing DOE Access Road. There is some potential for surface runoff from the DOE Access Road surface into Indian Creek. However, engineered design of the road according to BLM Manual Section 9113 and the Gold Book and implementation of BMPs included in AES' Stormwater Management Plan would minimize the potential for surface runoff during use of the existing DOE Access Road.

The National Hydrography Dataset (USGS, 2012) shows an ephemeral drainage intersecting the location proposed for the evaporation ponds within the Disposal Facility. WestWater Engineering examined this drainage (WoUS-2) and did not observe an obvious high water mark (see Appendix A); additionally the channel has been completely filled in with vegetation, indicating this is likely an upland condition. Hydrology feeding this drainage has been diverted to Cheney Reservoir during development of the adjacent DOE Cheney Site. No effects to this drainage are expected.

WestWater Engineering (see Appendix A) identified an ephemeral drainage (WoUS-3) and two seeps (Seep-1 and Seep-2) with associated wetlands within the Disposal Facility boundary, near the southwestern edge of the proposed land-farm. No development would occur in this area, and no effects to the drainages, seeps, or wetlands would occur.

The Disposal Facility would be designed according to AES's Stormwater Management Plan(s) prepared in accordance with CDPHE regulations and would have no off-site discharge. Components proposed within the Disposal Facility would also be lined and no effects to wetlands, drainages, or seeps within the property boundary of the Disposal Facility or outside would be expected.

Surface Water Quality

Increased runoff from ground surfaces exposed by the Proposed Action could increase selenium levels and sediment loads in Indian Creek if not controlled. However, engineered design of the road according to BLM Manual Section 9113 and the Gold Book and implementation of BMPs included in AES' Stormwater Management Plan would render potential effects immeasurable. Containment berms would be constructed around the evaporation ponds and all stormwater runoff within the facility would be contained on the site in the stormwater retention pond, minimizing the potential for surface water contamination.

Groundwater Quality

Construction of the Indian Mesa Access Road and power line is not expected to affect groundwater resources. Construction disturbance would be shallow with road cut-slopes not contacting groundwater. Effects to groundwater resources are expected to be minimal with implementation of BMPs included in AES's Stormwater Management Plan(s). Within the Disposal Facility on private lands, the proposed evaporation ponds would be fully lined and monitored to avoid off-site migration of any contaminants to minimize impacts to groundwater resources.

Water Rights

Potential effects to water rights are not anticipated with implementation of the Proposed Action.

Protective/Mitigation Measures

Additional Protective/Mitigation Measures

In addition to the protective measures described above, the BLM would require the following protective/mitigation measures to further reduce effects to water resources:

- Prior to construction of the Indian Mesa Access Road, AES should submit to BLM a copy of their Stormwater Management Plan(s) prepared in accordance with CDPHE regulations.
- GVP should not install the power pole within 50 horizontal feet of WoUS-1.
- The culvert on the Indian Mesa Access Road alignment should be professionally engineered and sized based on professionally acceptable modeling/field work, such as HEC RAS. The culvert should be placed along a straight reach of the stream in an area where the stream appears stable.
- The culvert should be properly maintained to minimize erosion, especially during storm events.
- AES should consult with the COE if construction occurs within any channel demonstrating an ordinary high water mark.
- The Stormwater Management Plan should be revised to include BMPs that would be implemented during construction of the Indian Mesa Access Road and power line.

Recommended Protective/Mitigation Measures

BLM cannot require AES to apply protective/mitigation measures for construction activities proposed on private lands. However, BLM recommends the following measure to minimize effects to water resources that could occur in the Project Area:

- WoUS-2 was dry at the time of the field survey and did not exhibit an ordinary high water mark (OHWM). The BLM recommends that AES consider consulting with the COE to obtain an upland verification prior to construction of the ponds.
- The land-farm should be constructed at least 325 feet from WoUS-3 and two seeps located in the southwest portion of the Disposal Facility property.

No Action Alternative

There would be no effects to water resources resulting from use of the existing DOE Access Road to the DOE Cheney Site, and construction of the new Indian Mesa Access Road and power line for the Disposal Facility on private land. Present activities using the existing ROWs to the DOE Cheney Site would continue.

3.2.3.3 Findings on Public Land Health Standards 5 and 2

Standard 5. Construction and operation of the proposed Indian Mesa Access Road and power line have the potential to affect hydrologic conditions and cause increased selenium levels in Indian Creek due to increased runoff from exposed ground surfaces. As discussed above, engineered design of the access road according to Gold Book and BLM Manual Section 9113 standards would render these potential effects to Indian Creek immeasurable.

Standard 2. No functioning riparian areas exist that would be directly affected by construction and operation of the Project.

3.2.4 Noise

3.2.4.1 Current Conditions

Noise measurements are not available for the vicinity of the project area. Local conditions such as traffic, topography, and winds characteristic of the region can alter background noise conditions. In general, sound levels (decibels – dB) at outdoor rural residential locations are about 40 dBA - decibels on the A-weighted scale - averaged for day and night periods (EPA, 1974). The existing ambient noise in the project area is dominated by the traffic noise from U.S. Highway 50. Levels of vehicular traffic on U.S. Highway 50, between milepost 51 to milepost 53 were 10,600 vehicles per day in 2008 (TurnKey Consulting, LLC, 2009), which produce estimated noise levels of 73.30 dBA at 50 feet from U.S. Highway 50, on average. Existing traffic noise might range from estimated 48 dBA to 57 dBA. Noise levels of 48 dBA are roughly equivalent to a refrigerator or residential area while noise in the range of 57 dBA is in the range of a window air conditioner or noisy urban residential area (Golden et al., 1980).

3.2.4.2 Environmental Consequences

Proposed Action Alternative

Noise levels would increase as a result of construction of the new access road, power line, and the commercial disposal facility. Noise resulting from construction would be short-term and temporary and would occur during daylight hours. During operations, noise would be generated by vehicles traveling on the access road; however, there are no noise sensitive areas within 1 mile of the Project Area.

Protective/Mitigation Measures

None.

No Action Alternative

Under this alternative, there would be no noise-related impacts resulting from construction and operation of either the proposed access road or the commercial disposal facility. Current noise levels would continue.

3.3 BIOLOGICAL RESOURCES

3.3.1 Invasive, Non-native Species

3.3.1.1 Current Conditions

Several lists of noxious weeds are identified under the Colorado Noxious Weed Act (Title 35, Article 5.5). The “A” list includes species in Colorado that the Department of Agriculture Commissioner designates must be eradicated. Alternatively, “B” listed species are those designated by the Commissioner (in consultation with the state noxious weed advisory committee, local governments, and other interested parties) for inclusion in state noxious weed management plans designed to stop the continued spread of these species. “C” listed species are also designated for state noxious weed management plans to support control and weed management on private and public lands by local governments with the goal of providing additional education, research, and biological control resources to jurisdictions that choose to require management of List C species (Colorado Department of Agriculture, 2014).

Surveys for noxious weeds occurred in May 2014 within at least 50-feet of proposed disturbance on both BLM-administered lands and private lands (see Appendix A). No A-listed species were found within the Project Area, but two B- and three C-listed species were observed (see Table 3.3-1). The most abundant weeds located in the Project Area on both

BLM-administered lands and private lands were cheatgrass, halogeton, and redstem filaree. Other noxious weeds present include Russian knapweed, tamarisk, and field bindweed. Two of the state-listed species present in the Project Area are on the Mesa County noxious weed list (Mesa County, 2013). Annual wheatgrass (not a Colorado state listed noxious weed) is also present in high densities in portions of the Project Area.

**Table 3.3-1
Noxious Weeds and Non-Native Plant Species Observed in the Project Area**

Common Name Scientific Name	Mesa County Noxious Weed List ²	Observation ³
Colorado State B List ¹		
Russian knapweed <i>Acroptilon (Centaurea) repens</i>	X	Several small infestations scattered within Project Area; dense within drainages.
Tamarisk (Saltcedar) <i>Tamarix ramosissima,</i> <i>Tamarix parviflora</i>	X ⁴	
Colorado State C List		
Downy brome (Cheatgrass) <i>Bromus tectorum</i>		Scattered throughout Project Area.
Field bindweed <i>Convolvulus arvensis</i>		Scattered along paved DOE Access Road.
Redstem filaree <i>Erodium cicutarium</i>		Scattered throughout Project Area.
Halogeton <i>Halogeton glomeratus</i>		Scattered throughout Project Area.
Sources: ¹ Colorado Department of Agriculture, 2014. ² Mesa County, 2013. ³ WestWater Engineering, 2014 (see Appendix A). ⁴ Not mandatory for control in Mesa County.		

3.3.1.2 Environmental Consequences

Proposed Action Alternative

The Project would disturb approximately 0.92 acre during construction of the proposed Indian Mesa Access Road and power line, and could disturb up to 113 acres during construction of the Disposal Facility on private lands (see Table 2.2-1). Clearing native vegetation and exposing bare ground surfaces allows invasive species, particularly annuals, to become established at the expense of native vegetation (West, 1988). Ground disturbance from construction of the Proposed Action could increase the presence of weed species included in Table 3.3-1 and increased vehicle traffic as a result of the Proposed Action could introduce weeds into areas that are not currently infested. Vehicles travelling on the access roads could potentially carry plant parts and/or seeds of noxious weed species from one location to another, thereby facilitating introduction and spread of new invasive species.

Successful and timely re-vegetation efforts along the Indian Mesa Access Road and power line disturbance, as well as final reclamation after the road and power line are no longer in use, are critical for ensuring that disturbed areas would not be infested with invasive and noxious weeds. Surface disturbance that would be re-vegetated within one growing season of construction would be less likely to be infested by weeds than if left as exposed soil for longer periods. If re-vegetation efforts are not successful, the likelihood of weed infestation would be much higher.

Protective/Mitigation Measures

In addition to the protective measures identified above, the BLM would require the following measures to further reduce impacts resulting from invasive, non-native species:

- Disturbed areas on BLM-administered lands should be re-vegetated with native seed mixes approved by the BLM GJFO that are certified to be weed-free. Restoration should be established within one year of completed road and overhead power line construction.
- Prior to ground-disturbing activities, noxious weeds and other undesirable plant species within disturbed areas that were documented by WestWater Engineering (see Appendix A) should be controlled within the Project Area. Methods used to eliminate and/or control those weeds should be approved by the BLM GFJO.
- AES should thoroughly clean all equipment prior to being brought onto BLM-administered lands to avoid contamination from noxious weeds. AES should also avoid driving vehicles through areas where seed infestations exist.
- AES should monitor the effectiveness of site restoration on BLM-administered lands annually, including presence of noxious weeds until restoration is considered successful by the BLM ecologist. An annual monitoring report should be submitted each year to the BLM AO.

No Action Alternative

Under this alternative, the potential for invasive, non-native species would not increase as a result of construction of the Indian Mesa Access Road and power line, and construction and operation of the Disposal Facility.

3.3.2 Vegetation (includes a finding on Standard 3)

3.3.2.1 Current Conditions

Existing vegetation within the Project Area was described by WestWater Engineering (see Appendix A) from observations during on-site survey efforts. Saltbush desert shrub community occurs throughout the Project Area and is dominated by mat saltbush and shadscale saltbush, forbs, and grasses. Portions of the saltbush desert shrub vegetation community are mixed with greasewood, and other portions of the Project Area have high densities of annual wheatgrass and plains pricklypear. A list of common plants found in the Project Area is included in the Biological Survey Report (see Appendix A - Table 2). Non-native, invasive weeds were observed throughout the Project Area (see Section 3.3.1).

Wetland vegetation occurs within approximately 0.41 acre in the vicinity of two seeps located in the southwest portion of the proposed Disposal Facility on private lands (see Appendix A). Non-native, invasive species including Russian knapweed and tamarisk grow along the seeps and ephemeral drainages located within the proposed Disposal Facility private parcel.

Public Land Health Standard 3 (Vegetation)

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential. Plants and animals at both the community and population level are productive, resilient, diverse, vigorous and able to reproduce and sustain natural fluctuations and ecological processes.

The BLM conducted a Land Health Assessment in the Kannah Creek Common Allotment that occurs in the Project Area (BLM, 2010). The assessment conducted within the Kannah Creek Common Allotment determined that 27 percent of the area met overall Land Health Standards, 48 percent of the area did not meet the Standards, and 25 percent was meeting but with

problems. Only a small portion of the Kannah Creek Common Allotment occurs in the Project Area, of which the majority is not meeting Standard 3 due to multiple factors:

- Lack of plant diversity,
- Site dominated by invasive species (cheat grass and annual wheatgrass) and/or annuals, with very few perennials, and
- Reduced reproduction of native species.

One site intersected by the Project was found to be meeting Standard 3, with problems due to reduced perennial grasses with moderate invasion of non-native species, although good shrub composition was noted.

3.3.2.2 Environmental Consequences

Construction of the Indian Mesa Access Road and power line on BLM-administered lands would remove approximately 0.92 acre of vegetation. After construction of the Indian Mesa Access Road and power line, 0.39 acre would be revegetated within the 5-foot short-term right-of-way and the power line right-of-way. Other effects to vegetation adjacent to the Indian Mesa Access Road could result from increased dust generated by construction and use of the access road; however, during construction and operation, AES would control fugitive dust through watering to minimize effects to adjacent vegetation. The DOE Access Road is paved, which during operation of the Disposal Facility should eliminate potential effects from fugitive dust on adjacent vegetation. To minimize dust transferred to the paved DOE Access Road during construction of the Disposal Facility, AES would install a vehicle tracking pad at the entrance to the facility that would remove soils from construction vehicle tires prior to exiting the facility; any additional sediment tracked onto the paved road would be removed through the use of a street sweeper. Vegetation within the Project Area could also be indirectly affected if invasive, non-native species become established in cleared or disturbed areas that would prohibit the growth of native and/or desirable species. As discussed above in Section 3.3.1, surface disturbance that would be revegetated within one growing season of construction would be less likely to be infested by weeds than if left as exposed soil for longer periods. At the end of the life-of-the project (30 years), the Indian Mesa Access Road and power line would be removed, if requested by BLM, and the area would be restored and revegetated as outlined in the POD. Reclamation would be considered successful when revegetated sites are at least 80 percent of basal cover as adjacent or nearby areas, which could occur 5 years after disturbance has been revegetated.

Construction of the Disposal Facility on private lands could disturb up to 113 acres over the life of the Project. Effects to vegetation would be similar to that discussed above for the construction on BLM-administered lands. AES would only disturb vegetation where necessary, and revegetate areas not needed for operations soon after disturbance. Remaining vegetation would be used in addition to other BMP measures identified in AES's Stormwater Management Plan(s) as measures to control stormwater and minimize soil erosion.

Protective/Mitigation Measures

No additional protective/mitigation measures have been identified by the BLM to further reduce effects to vegetation.

No Action Alternative

Under this alternative, there would be no effects to vegetation. Construction and operation of the Indian Mesa Access Road, power line, and the Disposal Facility would not occur. Present activities associated with the DOE Cheney Site would continue.

3.3.2.3 Finding on the Public Land Health Standard 3

Implementation of measures to eliminate or reduce the spread or introduction of noxious weeds would help prevent additional degradation of plant communities.

3.3.3 Threatened, Endangered, Candidate and Sensitive Animal Species

3.3.3.1 Current Conditions

Threatened and Endangered Species include those species listed by the FWS under the Endangered Species Act (ESA-Listed Species) and those listed by the State of Colorado. FWS Candidate species are not protected under the ESA, but are included below under ESA-Listed Species. Sensitive Species include those species identified by the BLM as being sensitive within the GJFO area, as well as those listed by the State of Colorado as threatened or endangered or species of concern, but not listed under the ESA.

Threatened, Endangered and Candidate Species.

The FWS (2014) identified ten vertebrate species listed under the ESA that potentially occur in Mesa County. One additional species is a candidate (see Table 3.3-2). Of these listed and candidate species, only the Colorado pikeminnow, razorback sucker, and bonytail could occur in the Project Area and are discussed below. The Biological Assessment (BA) prepared for this Project includes detail about the threatened and endangered species in Table 3.3-2 not discussed here because the Project would have “no effect” on the species. It is not expected that the Project would affect greater sage-grouse, a candidate species because no suitable habitat is present; the closest historical sage-grouse habitat is located approximately 8 miles north of the Project Area. No further discussion of greater sage-grouse is included in this EA.

Colorado River Fish. Three species of Colorado River Basin fish, the Colorado pikeminnow, razorback sucker, and bonytail are listed as endangered (FWS, 1970 and 1991) and critical habitat (FWS, 1994) has been designated for two of the species in the Colorado River and 100-year floodplain within Mesa County and in the Gunnison River and 100-year floodplain in Mesa and Delta counties.

A naturally reproducing population of Colorado pikeminnow inhabits the lower 54 kilometers (33.6 miles) of the Gunnison River mainstem (FWS, 2002a). Colorado pikeminnows move between the Colorado River and the Gunnison River by passing over the Redlands fish ladder at the Redlands Diversion Dam on the Gunnison River. Although the population size in the Gunnison River has not been estimated, there are fewer pikeminnows than in the Colorado River, based on fish captured and tagged (Osmundson and White, 2009). Young pikeminnows primarily utilize backwaters, preferring warm, turbid, relatively deep sites (<2 feet) with little to no flow (Tyus and Haines, 1991).

The wild population of razorback sucker in the Gunnison River is considered to be extirpated. The current population has been stocked with hatchery fish in the lower 33.6 miles of the Gunnison River (FWS, 2002b). Razorback suckers use the fish ladder at the Redlands Diversion Dam to move between the Colorado and Gunnison rivers. The razorback sucker is most often found in quiet, muddy backwaters along the river (FWS, 1994; CDOW, 2007b). Juvenile rearing habitats are in quiet, warm, shallow water associated with various river and floodplain features (FWS, 2002b).

**Table 3.3-2
ESA-Listed Endangered, Threatened, Proposed and Candidate Animal Species
that are Known or Have Potential to Occur within Mesa County**

Species Common Name Scientific Name	Status ¹		Critical Habitat
	ESA ²	State ³	
Mammals			
Canada lynx <i>Lynx Canadensis</i>	FT	SE	Not in County
Birds			
Mexican spotted owl <i>Strix occidentalis lucida</i>	FT	ST	Not in County
Yellow-billed cuckoo <i>Coccyzus americanus</i>	FT	SC	Mesa County, Not in Project Area
Gunnison's sage-grouse <i>Centrocercus minimus</i>	FT	SC	Mesa County, Not in Project Area
Greater sage-grouse <i>Centrocercus urophasianus</i>	FC	SC	N/A
Fish			
Greenback cutthroat trout <i>Oncorhynchus clarki stomias</i>	FT	ST	None
Colorado pikeminnow <i>Ptychocheilus Lucius</i>	FE	ST	Mesa County, Downstream from Project Area
Humpback chub <i>Gila cypha</i>	FE	ST	Mesa County, Not in Project Area
Bonytail <i>Gila elegans</i>	FE	SE	Mesa County, Not in Project Area
Razorback sucker <i>Xyrauchen texanus</i>	FE	SE	Mesa County, Downstream from Project Area
¹ ESA Status: FE = Federal Endangered, FT = Federal Threatened, FPE = Federal Proposed Endangered, FC = Federal Candidate. Colorado State Status: SE = State Endangered Species, ST = State Threatened Species, SC = State Candidate Species, None = No Status in Colorado. ² FWS, 2014. ³ CPW, 2014a.			

Until the 1950s, bonytail was historically common or abundant in warm-water reaches of large rivers from Mexico to Wyoming. During the 1960s through the early 1980s, adult bonytails were captured in the Upper Colorado River Basin including the Yampa River, Green River, and Colorado River mainstream (FWS, 2002c). Most recently, wild bonytails were captured in Lake Mohave, Nevada (in 2002) and Lake Havasu, Arizona (in 1990). Bonytail likely reside in the Gunnison River.

Critical habitat for Colorado pikeminnow and razorback sucker has been designated in the Gunnison River from its confluence with the Colorado River to the Uncompahgre River confluence at Delta. Critical habitat for the bonytail was designated within the Colorado River at Black Rocks down to Lake Powell. Three primary constituent elements (PCEs) of the critical habitat include water, physical habitat, and the biological environment (FWS, 1994). The water PCE includes quantity of water with sufficient quality (adequate temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity) that would provide for a life stage for each of the listed species at a specific location (FWS, 1994). The physical habitat PCE provides spawning, nursery feeding and rearing habitats, or access to those habitats and is found in river channels as well as bottom lands, side channels, secondary channels, oxbows, backwaters and other areas within the 100-year floodplain of the Gunnison River, which when inundated, provides habitats for the species' various life stages (FWS, 1994). Floodplains that have been previously

developed are not likely to provide PCEs (FWS, 1994). The biological environment PCE includes food resources for the listed species. Predation and competition by other species are additional components of the biological environment that are of concern because introduced, non-native fish species have limited population growth of listed species at some locations (FWS, 1994).

FEMA has not delineated the 100-year floodplain for the Gunnison River. However, the floodplain likely extends into Kannah Creek some distance from its confluence with the Gunnison River. Listed fish species are not expected to occur in Kannah Creek, although physical and/or water quality and quantity PCEs for Colorado pikeminnow and razorback suckers may be present near the confluence with the Gunnison River. Adult pikeminnows move to floodplain habitats, flooded tributary mouths and flooded side canyons that are only present during high spring flows (see Figure 3.3-1), probably in search of other fish as prey (Tyus, 1990; Osmundson et al., 1995).

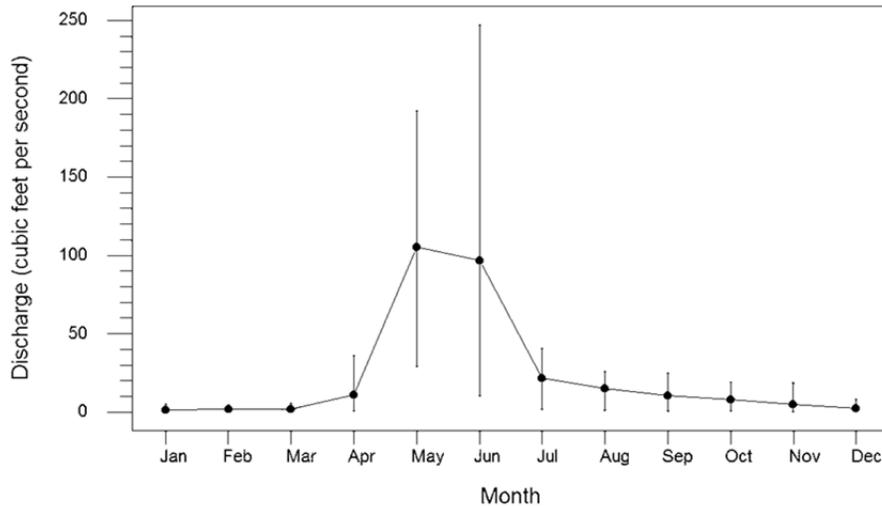


Figure 3.3-1
Average Monthly Discharge in Kannah Creek, 1961 to 1982, Measured at USGS Gage 09152000. Vertical Lines are Minimum and Maximum Monthly Flows.

BLM and State Special Status Species

In addition to candidate species and species listed under the ESA, the BLM and the State of Colorado have identified animal species as sensitive. There are eight species of mammals, five birds, three reptiles, two amphibians, three fish species, and one invertebrate included in Table 3.3-3 that are on the BLM sensitive species list (BLM, 2009b), are known or suspected to occur within the GJFO area, and could occur in the Project Area based on species ranges and habitat types present. Some BLM-sensitive wildlife species are also listed by the state (CPW) as endangered, threatened or as species of special concern (CPW, 2014a). Additional species that could occur in the Project Area and are listed by the state but have no federal status are also included in Table 3.3-3.

Two wildlife species in Table 3.3-3 have been observed within the Project Area: Brewer's sparrow and white-tailed prairie dog. CPW (2013) mapped the Project Area as white-tailed prairie dog habitat. Approximately 153 acres of prairie dog colonies were delineated within the Project Area, of which approximately 88 percent of the burrows observed were active (see Appendix A). Additional prairie dog habitat/colonies occur beyond those areas delineated for the Project, continuing west/southwest towards U.S. Highway 50 and expanding north to the bluffs, but greatly thinning out toward the southeast (Schell, 2014). Surveys for burrowing owls followed the CPW Burrowing Owl Protocol (see CDOW, 2007a) within the 153-acre area delineated as white-tailed prairie dog colonies within the Project Area; no nests were observed. River otters, a state-threatened species, now occur in lower Kannah Creek approximately 4 miles downstream of the Project Area following their release into the Gunnison River during the 1970s (Boyle, 2006; CPW, 2013). CPW (2013) mapped kit fox habitat in the Project Area and some of the sensitive bat species have been observed to the north, in the Book Cliffs area (Chung-MacCoubrey, 2008).

In addition to prairie dogs, Brewer's sparrows have been documented in the Project Area (see Appendix A). They are a sagebrush-obligate passerine that is relatively abundant in northwestern Colorado (Boyle and Reeder, 2005). The nesting season extends through early August (Kingery, 1998). Based on Breeding Bird Surveys conducted in the region surrounding the Project Area (Sauer et al., 2011), populations of Brewer's sparrows have been decreasing during the past 20 years, from 1992 through 2011. Bald eagles may also occur, particularly during winter. CPW has mapped bald eagle winter habitat west of the Project Area along the Gunnison River extending east to U.S. Highway 50. Potential peregrine falcon nesting habitat has been mapped on cliffs along the western face of Grand Mesa including the headwaters of North Fork Kannah Creek. It is possible that other sensitive herpetofauna and fish listed in Table 3.3-3 also occur within the Project Area or in waterbodies downstream from the Project Area, although they were not observed during surveys done in 2014; surveys specific to these species were not conducted (see Appendix A). The roundtail chub, bluehead sucker and flannelmouth sucker are likely to occur in portions of Kannah Creek given their presence in other tributaries to the Gunnison and the Colorado rivers. All three species are declining throughout their ranges and are the focus of a multi-state conservation strategy to minimize threats to the species and habitats (Karpowitz, 2006).

**Table 3.3-3
Federal and State of Colorado Sensitive Wildlife Species Not Listed
Under the ESA that Could Potentially Occur in the Vicinity of the Project Area**

Common Name Scientific Name	Habitat¹	Potential Occurrence² Nearest Record	Federal Status³	State Status⁴	Global/State Rank⁵
Mammals					
Townsend's big-eared bat <i>Corynorhinus townsendii pallescens</i>	Montane forests, pinyon-juniper woodlands, semi-desert shrublands.	Possible Distributed throughout Mesa Co.	BLM-S	SC	G4/S2
Spotted bat <i>Euderma maculatum</i>	Ponderosa pine in montane forest, pinyon-juniper woodlands, aspen, semi-desert shrublands.	Unlikely Limited distribution in Mesa Co.	BLM-S		G4/S2
Fringed myotis <i>Myotis thysanodes</i>	Ponderosa pine, greasewood, oakbrush, saltbush shrublands.	Possible Present in Book Cliffs, Mesa Co.	BLM-S		G4G5/S3
Big free-tailed bat <i>Nyctinomops macrotis</i>	Rocky slopes, canyon lands, roosts in crevices.	Possible Present in Book Cliffs, Mesa Co.	BLM-S		G5/S1
White-tailed prairie dog <i>Cynomys leucurus</i>	Open shrublands, arid grass-shrub and mountain valleys mostly in semidesert shrublands, also agriculture/pasture.	Present Active and inactive colonies scattered throughout Project Area.	BLM-S		G4/S4
Botta's pocket gopher <i>Thomomy bottae rubidus</i>	Agricultural land, grasslands, roadsides, open parklands, pinyon-juniper woodlands, open montane forest, montane shrublands and semidesert shrublands.	Possible Distribution includes western Mesa Co.		SC	S1
Northern pocket gopher <i>Thomomys talpoides macrotis</i>	Many different habitat types including agricultural and pasture lands, semidesert shrublands and grasslands, lower elevations into alpine tundra.	Possible Distributed throughout Mesa Co.		SC	S1
Northern River Otter <i>Lontra (Lutra) canadensis</i>	Riparian habitats and permanent water with abundant fish and/or crustaceans. Present in the Gunnison River.	Present Kannah Creek.		ST	none
Kit fox <i>Vulpes macrotis</i>	Semidesert shrubland and margins of pinyon-juniper woodlands; saltbush, sagebrush, greasewood.	Possible Potential habitat in Project Area.	BLM-S	SE	G4/S1
Birds					
Bald eagle <i>Haliaeetus leucocephalus</i>	Reservoirs, rivers, wintering in semidesert and grasslands.	Possible Winter habitat along Gunnison River.	BLM-S	SC	G5/S3N
Ferruginous hawk <i>Buteo regalis</i>	Grassland, semidesert shrublands, rare in pinyon-juniper. Nests on isolated structures.	Unlikely Potential nesting habitat not present.	BLM-S	SC	G4/S3B
American peregrine falcon <i>Falco peregrinus anatum</i>	Open conifer forests, riparian forests and cliffs; migrant in western Colorado.	Possible Potential nesting habitat >2 miles away.		SC	G4/S2B
Western burrowing owl <i>Athene cunicularia</i>	Grasslands in or near prairie dog towns. Potential habitat is <1 mile away.	Possible Prairie dog habitat in Project Area.	BLM-S	ST	G4/S4B

Common Name Scientific Name	Habitat ¹	Potential Occurrence ² Nearest Record	Federal Status ³	State Status ⁴	Global/State Rank ⁵
Brewer's sparrow <i>Spizella breweri</i>	Mostly in sagebrush shrubland but also in mountain mahogany and rabbitbrush; mesas and foothills.	Present Observed within the Project Area.	BLM-S		G5/S4B
Reptiles					
Longnose leopard lizard <i>Gambelia wislizenii</i>	Flat or gently sloping, open ground shrublands.	Possible Suitable habitat present.	BLM-S	SC	G5/S1
Milk snake <i>Lampropeltis triangulum taylori</i>	Grasslands, sandhills, canyons, open woodlands ponderosa, pinyon-juniper.	Possible Suitable habitat present.	BLM-S		G5/S1
Midget faded rattlesnake <i>Crotalus oreganus concolor</i>	Most terrestrial habitats in western and west-central Colorado.	Possible Suitable habitat present.	BLM-S	SC	G5/S3
Amphibians					
Great Basin spadefoot toad <i>Spea intermontana</i>	Pinyon-juniper woodlands, sagebrush, semidesert shrublands, stream floodplains, canyon bottoms.	Possible Potential habitat along drainages.	BLM-S		G5/S3
Northern leopard Frog <i>Rana pipiens</i>	Margins, banks of marshes, ponds, streams, other permanent water.	Possible Suitable habitat present within seeps.	BLM-S	SC	G5/S3
Fish					
Roundtail Chub <i>Gila robusta</i>	Colorado River drainage, mostly large rivers, also streams and lakes. Spawns in early summer after spring runoff.	Possible Suitable habitat present downstream of Project Area.	BLM-S	SC	G3/S2
Bluehead Sucker <i>Catostomus discobolus</i>	Headwater streams to large rivers with moderate velocity, not in standing water; prefers rock substrate. Spawns in spring or summer.	Possible Suitable habitat present downstream of Project Area.	BLM-S	SC	G4/S4
Flannelmouth Sucker <i>Catostomas latipinnis</i>	Larger streams and rivers with riffles, eddies, backwaters. Spawns early May to early August.	Possible Suitable habitat present downstream of Project Area.	BLM-S		G3G4/S3
Invertebrates					
Great Basin Silverspot Butterfly <i>Speyeria nokomis nokomis</i>	Spring-fed meadows, seeps, marshes, boggy streamside meadows with flowing water; bog violets are larval food plants.	Unlikely Record >25 miles away (CNHP).	BLM-S		G4/S1

¹ Sources: CPW, 2014a; Andrews and Righter, 1992; Hammerson, 1986; Woodling, 1985; Fitzgerald et al., 1994; Chung-MacCoubrey, 2008.

² Potential Occurrence:

Unlikely: May or may not occur in Mesa County but no suitable habitat.

Possible: Occurs in Mesa County, suitable habitat is present, but not observed in Project Area.

Present: Occurs in Mesa County, including the Project Area and/or immediate vicinity.

³ Federal Status: FC = Federal Candidate, BLM-S = BLM Sensitive.

⁴ State Status: SC = State Species of Special Concern, SE= State Endangered , ST = State Threatened.

⁵ Colorado Natural Heritage Program ranks:

Global Rank: G1 = Critically Imperiled, G2= Imperiled, G3= Vulnerable, G4 = Apparently Secure, G5 = Widespread, abundant. Q = Questionable Taxonomy

State Rank: S1= Critically Imperiled, S2= Imperiled, S3= Vulnerable, S4 = Apparently Secure. A "B" after the rank indicates the rank applies to Breeding Habitat.

3.3.3.2 Environmental Consequences

Proposed Action Alternative

Threatened, Endangered and Candidate Species. The only animal species listed under the ESA that would be potentially affected by the Project are three endangered Colorado River Fish species: Colorado pikeminnow, bonytail, and razorback sucker.

Colorado River Fish. The endangered fish could be affected through one or more of the following pathways:

1. Decreased water quality from mobilized selenium in tributaries to the Gunnison River.
2. Hazardous materials affecting tributaries and critical habitats downstream of the Project in the Gunnison River.

Decreased Water Quality. Selenium is a semi-metallic trace element that is widely distributed in Upper Cretaceous and Tertiary marine sedimentary rocks in the Western United States (Bureau of Reclamation et al., 1998). Selenium is an essential element for animals in small amounts, but exposures to slightly higher amounts is toxic to vertebrates, often compounded by bioaccumulation of selenium through terrestrial and aquatic food chains (Hamilton, 2004; Bureau of Reclamation et al., 1998; Lemly, 1993; Lemly, 1996; Peterson and Nebeker, 1992).

High concentrations of selenium have been found in Colorado pikeminnows inhabiting the Colorado River downstream from the Grand Valley Diversion Dam at Palisade (Osmundson et al., 2000). The levels of selenium in muscle tissue of pikeminnows in the river exceeded levels recognized as toxic to fish (Lemly, 1993; Lemly 1996). Selenium concentrations at low levels (2 to 5 micrograms per liter - µg/L) in water can affect fish reproduction and populations, but higher selenium levels (10 to 20 micrograms per kilogram - µg/kg) could result in teratogenesis, or abnormal embryonic developmental, in embryos (Bureau of Reclamation et al., 1998; Lemly, 1996).

Geologic maps indicate that the Project Area overlies surface layers that are highly correlated with selenium in water runoff: Quaternary gravels and alluvium, and Cretaceous shales/sandstones. Runoff from these strata has been related to elevated loads of salt and selenium concentrations in the Upper Colorado River Basin (Lieb et al., 2012). Construction and maintenance of the Indian Mesa Access Road and power line on BLM-administered lands, and construction and operation of the Disposal Facility on private lands could increase selenium concentrations in Indian Creek, Kannah Creek, and the Gunnison River through surface runoff following precipitation. Introduction of additional selenium into critical habitats associated with the Gunnison River could further hinder recovery of the endangered Colorado River fish. Engineered design of the access roads according to BLM Manual Section 9113 and the Gold Book, implementation of BMPs included in the Stormwater Management Plan(s) in accordance with CDPHE regulations, construction of containment berms around the evaporation ponds in the Disposal Facility, and containment of all stormwater runoff within the Disposal Facility in the stormwater retention pond would limit the amount of selenium that could be transported to Kannah Creek or the Gunnison River downstream from the Project.

Spills and Weed Control. Diesel fuel spills could affect freshwater stream macroinvertebrates for more than one year after a spill (Lytle and Peckarsky, 2001). Diesel fuels and lubricating oils are considerably more toxic to aquatic organisms than other, more volatile products (gasoline) or heavier crude oil (Markarian et al., 1994). Impacts to aquatic habitats that primarily affect aquatic substrates – hence fish spawning, incubating and rearing habitats – can remain for much longer periods (Lytle and Peckarsky, 2001; Markarian et al., 1994). Implementation of

measures in AES's Stormwater Management Plan(s) would minimize potential for inadvertent fuel spills or release of other hazardous materials that might affect endangered Colorado River fish and designated critical habitat approximately 4 miles downstream from the Project Area in Kannah Creek.

Control of noxious weeds within the Project Area could involve the use of several commercial herbicides that may present a high toxicity risk to endangered fish species (e.g., Fairchild, 2003), although some herbicides are practically non-toxic to fish (Washington State Department of Transportation, 2011). Implementing measures recommended by the BLM GJFO to control or eliminate noxious weeds and other undesirable plants within the Project Area would minimize or eliminate potential adverse effects to endangered Colorado River fish and designated critical habitat downstream from the Project Area.

The BLM GJFO submitted a BA to the FWS Western Colorado Ecological Services Field Office requesting formal ESA consultation for the Proposed Action. The BA describes expected effects to ESA-listed species and provides conservation measures to prevent adverse effects to ESA-listed species. Site-specific minimization measures are included in the BA to avoid or minimize direct, indirect, and cumulative effects to the endangered Colorado River fish. The FWS prepared a Biological Opinion (TAILS 06E24100-2015-F-0009) on March 9, 2015, which concurred with the BLM GJFO determination that the proposed project may affect, not likely to adversely affect the Colorado pikeminnow, razorback sucker, and bonytail chub and critical habitat for the pikeminnow and razorback sucker.

BLM and State Special Status Species. Special status animal species that were observed or could occur in the Project Area (see Table 3.3-3) are discussed here. Effects to Brewer's sparrow, a BLM-sensitive bird species observed within the Project Area are discussed in Section 3.3-6, Migratory Birds, including appropriate conservation measures. Habitat loss, increased fragmentation, temporary animal displacement and possible direct impacts to individuals (e.g., mortality, abandonment of nesting territories, harassment) are possible.

During construction of the Indian Mesa Access Road and power line on BLM-administered lands, approximately 0.17 acre of suitable prairie dog habitat would be removed. Removal of 0.17 acre of suitable habitat should not adversely affect the white-tailed prairie dog population, especially considering the large area mapped by CPW of overall white-tailed prairie dog habitat in the vicinity of the Project Area and incidental observations of continued prairie dog habitat beyond the extent delineated within the Project Area (Schell, 2014). Road construction and grading of the Indian Mesa Access Road could result in death of individual prairie dogs, although disturbed soils caused by construction in the roadside ditches and the power line right-of-way would possibly attract prairie dogs and other burrowing mammals (Botta's pocket gopher, northern pocket gopher). Constructing outside of the white-tailed prairie dog pupping season on BLM-administered lands from April 1 through July 15 would minimize effects to active white-tailed prairie dog towns within the Project Area. Vehicle use of the Indian Mesa Access Road and increased traffic volume on the existing DOE Access Road could increase prairie dog mortality in the Project Area. Limiting the speed of vehicles on access roads would minimize this potential effect.

No burrowing owls were documented during survey efforts in 2014; however, burrowing owls could occur in the future within prairie dog burrows that are scattered throughout the Project Area. Threats to burrowing owls include loss of habitat through prairie dog eradication programs, agricultural and urban conversion, the absence of grazing that keeps vegetation low, insecticides and pesticides, and collisions with moving vehicles (FWS, 2003; McDonald et al., 2004). Impact from collisions with burrowing owls could occur over the long-term with vehicle use of the access roads. Limiting the speed of vehicles on access roads would minimize this

potential effect. Brewer's sparrow could also occur, but no sagebrush-dominated vegetation used for nesting would be affected by the Proposed Action.

Kit fox could occur within the Project Area. Westwater Engineering conducted diurnal surveys that included searching for potential dens but no sign (scat or burrows) were observed; however surveys specific to the species were not conducted; therefore, the species may occur in the Project Area (see Appendix A). Kit fox could be killed by vehicles and vehicle-related mortality has occurred in Utah and near Delta, Colorado (Boyle and Reeder, 2005).

Bluehead sucker, flannelmouth sucker, and roundtail chubs could be affected by increased salt loads and selenium concentrations similar to effects described for Colorado pikeminnows and razorback suckers, above. However, those three species are not expected to inhabit the upper reaches of Indian Creek within the Project Area. Other special status animal species were not documented during surveys conducted in 2014, but several species could occur based on habitat present and could be affected by degradation and/or alteration to habitat. Habitat would be restored at the end of the Project.

Protective/Mitigation Measures

In addition to the measures discussed above and measures identified by the FWS in the Biological Opinion prepared for this Project, the BLM would require the following measures to further reduce impacts to ESA and Sensitive Animal Species:

- During dust suppression, water should not be applied to surfaces in volumes that would flow into drainages.
- All herbicides used in the vicinity of drainages should be non-toxic to fish and other aquatic organisms and would be labeled for aquatic use (e.g., metsulfuron-methyl, imazapyr, and clopyralid). If use of non-toxic herbicides is not possible, other measures should be used such as biological or mechanical measures to control noxious weeds.
- To minimize effects to active white-tailed prairie dog towns within the Project Area, ground-disturbing activities should be avoided within active white-tailed prairie dog towns during pupping season on BLM-administered lands from April 1 through July 15.
- Vehicle speeds should be limited on the existing DOE Access Road and Indian Mesa Access Road to 30 miles per hour to reduce the potential for vehicle-animal collisions.

No Action Alternative

Under the No Action Alternative, none of the direct and indirect effects to Colorado River endangered fish and their designated critical habitats, or to BLM and state special status animal species would occur. The existing DOE Access Road would continue to be used to access the DOE Cheney Site.

3.3.4 Threatened, Endangered, Candidate and Sensitive Plant Species

3.3.4.1 Current Conditions

Threatened, Endangered and Candidate Species.

ESA-Listed and Candidate Species. The FWS (2104) identified two plant species listed under the ESA that occur in Mesa County: Colorado hookless cactus and DeBeque phacelia. Of these listed species, only the Colorado hookless cactus occurs and/or is expected in the Project Area and is discussed below. The BA prepared for this Project includes more detail about DeBeque phacelia not discussed here because the Project would have "no effect" on the species. No candidate plant species were identified in Mesa County.

Colorado Hookless Cactus. Colorado hookless cactus is a federally-listed threatened plant (FWS, 1979, 2007 and 2009) that occurs on river benches, valley slopes and rolling hills in Delta, Garfield, Mesa and Montrose counties, Colorado (FWS, 1990). Colorado hookless cactus generally grows on soils that are unusually coarse, gravelly river alluvium above river floodplains and usually with Mancos Shale with volcanic cobbles and pebbles as components on the surface (FWS, 2010a). Two population centers occur in Colorado, one of which occupies alluvial river terraces of the Colorado River and in the Plateau of Roan Creek drainages in the vicinity of De Beque, Colorado and the other which is located on alluvial river terraces of the Gunnison River extending from Delta, Colorado to southern Mesa County including the Project Area. Recent research by the Denver Botanic Gardens has determined that the two populations are genetically distinct (McGlaughlin and Ramp-Neale, 2012; Denver Botanic Gardens, 2013). Approximately 23,000 individuals have been documented within 94 Colorado Natural Heritage Program (CNHP) element occurrence records, although some of these individuals are historic because approximately 21 of the element occurrences have not been observed in over 20 years (CNHP, 2014). No critical habitat has been designated or proposed for this species.

Surveys for Colorado hookless cactus were conducted within the Project Area in April and May 2014 by WestWater Engineering (see Appendix A). Approximately 254 acres of potential cactus habitat were surveyed within 100 meters of proposed disturbance including the proposed Indian Mesa Access Road, power line, and the 160-acre Disposal Facility as recommended by the BLM GJFO, as well as the Project footprint. Cacti beyond 100 meters of proposed disturbance were documented incidentally during other biological survey efforts for this Project. Surveys were not conducted along the existing paved DOE Access Road because no additional surface disturbance is expected. Sixty-five Colorado hookless cactus plants were documented within 150 meters of proposed disturbance on BLM-administered lands and the Disposal Facility on private lands, and an additional 18 plants were located further than 150 meters of both activities on BLM-administered lands. The majority of cacti documented were 1 to 3 inches in diameter; many of the cacti were growing within or under saltbush plants (see Appendix A).

BLM Sensitive Plant Species. The BLM (2012a; Appendix B) identified 22 species of sensitive vascular plants that are known or could occur within the GJFO management area; however, based on known range of each species and habitat present within the Project Area, only Grand Junction suncup would be expected. Surveys for Grand Junction suncup were conducted according to BLM GJFO plant inventory standards (see BLM, 2012a) in late April and early May, 2014 within the Project footprint and within 100 meters of proposed ground-disturbance; no plants were found (see Appendix A).

Public Land Health Standard 4 (Special Status, Threatened and Endangered Animal and Plant Species)

Standard 4: Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

The BLM assessed Land Health Standards within the Project Area in the Kannah Creek Common Allotment (BLM, 2010). Of the 3,931 acres evaluated in the Kannah Creek Common Allotment, 14 percent of the area was meeting land health standards, 63 percent was meeting standards but with problems, and 23 percent was not meeting standards. Loss of plant diversity, absence of perennial grasses and dominance of invasive non-native species has created a degraded habitat for wildlife in the Project Area. Landscape conditions result from past and present grazing practices, drought and surface disturbances associated with oil and gas. Sensitive species' habitats that are currently degraded could be improved through protection of soils, restoration of native vegetation and weed management.

Approximately half of the BLM-administered lands that are not meeting standards or are meeting standards but with problems are considered to be affected by noxious weed infestations, especially cheatgrass as well as loss of perennial vegetation and general plant diversity.

3.3.4.2 Environmental Consequences

Proposed Action Alternative

The Proposed Action could affect special status plants through one or more of the following pathways:

1. Direct mortality of plants and/or destruction of seed banks during clearing and grading, and construction of the proposed Project.
2. Fragmentation and isolation of existing populations and areas of suitable habitat.
3. Increased populations of invasive noxious weed species that interfere with growth and survival of ESA-listed plants.
4. Damage or mortality of individual plants by dust deposited on photosynthetic surfaces during construction and operation.
5. Changes in characteristics (shade, temperature, soil moisture, species composition, etc.) that alters suitable habitat.
6. Loss of pollinators due to habitat alteration, dust, and/or increased presence of invasive, noxious weeds.
7. Accidental release of toxic compounds during construction and/or operation.

ESA-Listed Plant Species. The FWS (2013) considers that effects to cactus could occur at distances to 150 meters from proposed disturbance, with adverse effects within 50 meters. Direct effects to Colorado hookless cactus are most likely to occur where plants are located within the footprint of proposed disturbances or in close proximity (within 50 meters) of the proposed disturbance, which could result in loss or degradation of cactus populations, decreased cactus seed production, decreased recruitment, and increased occurrence of plant damage or individual mortality. Impacts could include removal or damage to individual plants or seed banks in the soil if ground-disturbing activities, including construction and operation equipment or workers go beyond the expected limits of construction or property boundaries. Increased fugitive dust from construction of the Indian Mesa Access Road and power line and/or construction and operations of the Disposal Facility could impact cacti within close proximity of the activities (FWS and BLM, 2007). Dust accumulation on the plants could increase tissue temperature and impair photosynthesis, gas exchange, transpiration, use efficiency, leaf morphology, and stomata function (Farmer, 1993; Sharifi et al., 1997; Rai et al., 2009). However, cactus stomata are closed during daylight as an adaptation to minimize water loss. Crassulacean acid metabolism allows stomata to be closed during photosynthesis while stomata are open at night, allowing for gas exchange under conditions of lower temperature and transpiration rates (Rebman and Pinkava, 2001). Therefore, the extent of effects to stomata function by dust generated during the day is unknown.

Indirect effects to Colorado hookless cactus plants are expected within 150 meters of ground disturbance, and could occur as a result from heavy dust created during construction and operation. Dust could indirectly interfere with cactus reproduction by affecting pollinators during the flowering season. Other indirect impacts to cactus plants include changes in hydrology and soil characteristics, an increase in competitive noxious weeds, and alterations of vegetation cover and species composition. Soil compaction could result in a change in hydrology, possibly indirectly altering vegetation composition that may compete with the Colorado hookless cactus. Ground disturbance and increased traffic would increase the likelihood for noxious weeds to

become established, which could also alter vegetation cover and species composition, potentially out-competing the cactus. Fragmentation of suitable habitat or a plant population could occur from new road construction and construction of the Disposal Facility, which could increase spatial isolation of plant populations and may result in reduced viability and genetic variability. Road construction could restrict or block movement of potential Colorado hookless cactus pollinators between occupied habitats. Increased traffic along the existing DOE Access Road could increase the death rate of pollinators in the Project Area as a result of collisions with passing vehicles, which could affect the genetic flow and pollination of Colorado hookless cactus in the Project Area.

Site-specific Effects. No Colorado hookless cactus plants were documented within 150 meters of proposed disturbance associated with construction of the Indian Mesa Access Road and power line on BLM-administered lands; therefore, no effects to cacti are expected from construction, use, and reclamation of these Project components.

Approximately 65 cactus plants were documented within 150 meters of the Disposal Facility boundary that could be affected by construction and operation of the Disposal Facility (see Table 3.3-4), of which approximately 28 cactus plants occur within the 160-acre Disposal Facility boundary on private lands. The other 37 cactus plants occur on BLM-administered lands outside of the proposed Disposal Facility boundary, of which 20 cactus plants are located within 50 meters of the Disposal Facility boundary and could be adversely affected during construction of the facility including installation of the wildlife-friendly fence around the perimeter of the Disposal Facility. Of the 28 cactus plants that occur within the Disposal Facility boundary, at least 21 plants would be removed during construction of the Disposal Facility based on plans submitted in the Mesa County CUPs. Removal of Colorado hookless cactus plants within the Disposal Facility boundary on private lands cannot be avoided. Transplanting the Colorado hookless cactus plants that occur within the Disposal Facility boundary to adjacent BLM-administered lands near other cacti documented during survey efforts for this Project would provide an opportunity to salvage the plants and enhance populations on BLM-administered lands. Monitoring the transplants for at least 20 years, as recommended by FWS (2013) would provide invaluable information to the FWS for further conservation of the species. Table 3.3-4 summarizes the number of Colorado hookless cactus plants within 150 meters of the Proposed Action on BLM-administered lands and the Disposal Facility on private lands.

During construction and maintenance of the Indian Mesa Access Road and power line and construction and operation of the Disposal Facility on private lands, AES would control fugitive dust through water sprinkling; additionally, AES would suspend Disposal Facility activities during periods of high wind. This would minimize effects from dust on cactus plants located within 150 meters of the Disposal Facility boundary. AES surveyed for noxious weeds in the Project Area; controlling weeds during construction and operation of the Project would reduce the potential for non-native species to compete with the cactus plants in the Project Area. Immediately after road and power line construction, vegetation within disturbed areas (short-term right-of-way and along the power line right-of-way) would be revegetated, which would further reduce the potential for weeds to be established and outcompete cacti in the Project Area. To minimize surface run-off and changes in hydrology, AES would improve and/or construct the access roads according to BLM Manual Section 9113 and the Gold Book and would implement BMPs included in AES's Stormwater Management Plan(s) prepared in accordance with CDPHE regulations. Containment berms would be constructed around the evaporation ponds and all stormwater runoff within the facility would be contained on the site,

minimizing the potential for altering the hydrology and vegetation composition in the vicinity of Colorado hookless cactus plants.

**Table 3.3-4
Summary of Colorado Hookless Cactus Plants Located During Surveys ¹
within 150 meters of the Project**

Project Component	Landowner	Plants Removed	Number of Plants > 0 m but < 50m	Number of Plants > 50m but < 150m	Total Number of Plants < 150m
Indian Mesa Access Road and Overhead Power Line (BLM-administered lands)					
New Access Road/Powerline	BLM	0	0	0	0
	Private	0	0	0	0
	Total	0	0	0	0
Disposal Facility (private lands)					
Proposed Disposal Facility Disturbance ²	BLM	0	20	17	37
	Private	21 ³	7 ³	0	28
	Total	21	27	17	65
¹ Colorado hookless cactus locations determined from survey efforts conducted in 2014 (see Appendix A). ² Proposed Disposal Facility Disturbance includes: evaporation ponds, land-farm, landfill, haul roads, loadout facility, and stormwater retention pond. ³ Currently proposed disturbance expected on private lands is expected to remove approximately 21 Colorado hookless cactus plants during construction of the Disposal Facility. An additional seven plants documented on private lands could be removed.					

Construction of the Indian Mesa Access Road and power line would remove approximately 0.92 acre of suitable Colorado hookless cactus habitat and fragment existing populations; 0.39 acre would be revegetated within the 5-foot short-term right-of-way and the power line right-of-way. However, placement of the Project adjacent to existing disturbance (i.e., existing paved DOE Access Road and DOE Cheney Site) would reduce the amount of additional fragmentation within Colorado hookless cactus habitat.

The BLM GJFO submitted a BA to the FWS Western Colorado Ecological Services Field Office requesting formal ESA consultation for the Proposed Action. Formal consultation was requested because Colorado hookless cactus plants were documented within the proposed Disposal Facility on private lands and within 50 meters of the Disposal Facility on BLM-administered lands. Construction of the Disposal Facility would adversely affect Colorado hookless cactus plants. The BA describes expected effects to ESA-listed species and provides conservation measures to prevent adverse effects to ESA-listed species. Site-specific minimization measures are included in the BA to avoid or minimize direct, indirect, and cumulative effects to ESA-listed plant species. The FWS prepared a Biological Opinion (TAILS 06E24100-2015-F-0009) on March 9, 2015, which concurred with the BLM GJFO determination that the Proposed Action may affect, is likely to adversely affect Colorado hookless cactus.

BLM Sensitive Plant Species. No BLM sensitive plants species were documented during survey efforts conducted in spring 2014 (see Appendix A); no effects from construction of the Proposed Action is expected.

Protective/Mitigation Measures

In addition to the mitigation measures included above and measures identified by the FWS in the Biological Opinion prepared for this Project, the BLM would require the following measures to further reduce impacts to threatened, endangered and sensitive plant species:

- Colorado hookless cactus plants documented on BLM-administered lands within 50 meters (164 feet) of proposed disturbance for the Disposal Facility on private lands should be included in the long-term monitoring study to compare an in situ sub-population of cactus to the transplanted cacti.
 - Plants should be photographed and tagged prior to ground-disturbing activities.
 - Plant width and height should be measured along with the number of blooms and tubercles.
 - Plant status and health should be described, including presence of weed species, if any.
 - A monitoring report should be submitted to BLM GJFO and FWS after each annual survey.
- Weed treatments should be limited to spot treatments within areas with sensitive plant species subject to site-specific pre-approval by the BLM.
- Gate installation activities should be limited to areas of prior disturbance, as biological surveys were not conducted along the existing DOE Access Road. The installation of the gate should not cause any new surface disturbance.

Recommended Protective/Mitigation Measures

BLM cannot require AES to apply protective/mitigation measures for construction on private lands. However, BLM recommends the following measures to minimize effects to the federally-threatened Colorado hookless cactus located on both BLM-administered lands and private lands:

- No surface-disturbing activities should occur within 150 meters of Colorado hookless cactus during the flowering period (April and May), with the exception of transplanting activities.
- No surfactants (i.e., magnesium chloride) should be used to control fugitive dust within 150 meters of Colorado hookless cactus plants, unless approved by BLM.
- To reduce the potential for altering hydrology/habitat within occupied habitats on BLM-administered lands, and minimize fugitive dust on Colorado hookless cactus plants adjacent to the Disposal Facility boundary, AES should install the following measures on the edge of the Disposal Facility boundary:
 - straw bale wattles where cactus are within 50 meters of the Disposal Facility boundary, and
 - silt fence where cactus are within 100 meters of the Disposal Facility boundary.
- AES should transplant all Colorado hookless cactus plants documented within the Disposal Facility boundary to BLM-administered lands adjacent to the Disposal Facility. Colorado hookless cactus transplants site selection should take into account the wind flow pattern for the region (see Section 3.2.1), habitat quality, as well as location of cacti documented on BLM-administered lands adjacent to the Disposal Facility. Several methods have been used in Colorado to transplant Colorado hookless cactus plants. BLM would work with the FWS to develop a plan to transplant the Colorado hookless cactus plants prior to ground-disturbing activities. Monitoring should occur annually for the first 10 years, and then at an established interval for the remaining years (see FWS, 2013). Monitoring should include measurements of width and height, and tubercle and bloom counts.
- Disturbed areas at least on BLM-administered lands should be revegetated with native seed mixes approved by the BLM GJFO that are certified to be weed-free. Restoration should be established within one year of completed road and power line construction.

No Action Alternative

Under the No Action Alternative, none of the direct and indirect effects to Colorado hookless cactus plants, or to BLM sensitive plant species would occur. The existing DOE Access Road would continue to be used for access to the DOE Cheney Site.

3.3.4.3 Finding on the Public Land Health Standard 4 (Special Status, Threatened and Endangered Animal and Plant Species)

Further habitat degradation from invasive vegetative species could occur under the Proposed Action and could affect special status species in the Project Area. However, with implementation of minimization measures, management of invasive and noxious weeds and timely reclamation of the disturbed area, the Proposed Action would not be expected to substantially affect the area's capacity to meet Public Land Health Standard 4. No changes in Land Health Standard 4 are anticipated under the Proposed Action if the design features and mitigation measures are properly implemented.

3.3.5 Migratory Birds

3.3.5.1 Current Conditions

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties for the protection of migratory birds. EO 13186, issued in 2001, directed actions that would further implement the MBTA. As required by MBTA and EO 13186, the BLM signed a Memorandum of Understanding (MOU) with the FWS in 2010 which is intended to strengthen migratory bird conservation efforts by identifying and implementing strategies to promote conservation and reduce or eliminate adverse impacts on migratory birds. The focus of the BLM's conservation efforts are on migratory species and some non-migratory game bird species that are listed as Birds of Conservation Concern (BCC). All BCC species are also included on the BLM GJFO sensitive species list. BCC have been identified by the FWS (2008) for different Bird Conservation Regions (BCR) in the United States. The Project Area is in BCR 16, the Southern Rockies/Colorado Plateau.

The Project Area primarily consists of saltbush desert shrub community. Limited riparian habitat (i.e., tamarisk) occurs along the ephemeral drainages that could provide habitat and/or potential habitat for numerous migratory birds, including five of the 27 species listed in BCR 16 by the FWS as a BCC: burrowing owl, golden eagle, peregrine falcon, prairie falcon, and Brewer's sparrow. Surveys for burrowing owls (see Section 3.3.4) and other woodland-nesting raptors were conducted in 2014 but none were found (see Appendix A). A red-tailed hawk was observed incidentally perched near Indian Creek south of the proposed Disposal Facility (see Appendix A). Additional surveys were conducted in June 2014 for the presence of other BCC and their habitat: two Brewer's sparrows were observed within mixed greasewood shrubland and near the existing DOE Access Road; no nests were observed (see Appendix A). Estimates of population trends for Brewer's sparrow within BCR 16 (Sauer et al., 2011) indicate that the species has been declining between 1981 and 2010.

Three other bird species were observed within the Project Area during survey efforts (see Appendix A): broad-tailed hummingbird, common raven, and horned lark. These birds are listed as Nearctic and Neotropical migratory birds by the FWS, Division of Bird Habitat Conservation, pursuant to the Neotropical Migratory Bird Conservation Act and are protected under the MBTA (FWS, 2010b).

Public Land Health Standard 3 (Migratory Birds)

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential.

The BLM assessed Land Health Standards within the Project Area in the Kannah Creek Common Allotment (BLM, 2010). Loss of plant diversity, absence of perennial grasses and dominance of invasive non-native species have degraded habitat for wildlife in the Project Area. The landscape results from past and present grazing practices, drought and surface disturbances associated with oil and gas. Sensitive species' habitats that are currently degraded could be improved through protection of soils, restoration of native vegetation and weed management.

3.3.5.2 Environmental Consequences

Proposed Action Alternative

The FWS has primary responsibility for administering the MBTA, which prohibits taking, killing, or possessing migratory birds, their parts (feathers, talons), nests or eggs. EO 13186 directed federal agencies to avoid take under the MBTA, whether intentional or unintentional (with BCC as priorities) and to implement conservation measures to restore and enhance habitat for migratory birds, including the development of surface operating standards for oil and gas developments, management of invasive species to benefit migratory birds, minimization or prevention of pollution, or avoidance of detrimental alteration of habitats utilized by migratory birds.

In the 2010 MOU pursuant to EO 13186, the BLM committed to identify where take under the MBTA could be reasonably attributable to agency actions that could have a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats and key risk factors. One approach to lessening take is to avoid actions during nesting seasons. BLM (2007b) determined that impacts to nesting migratory birds could be minimized or avoided by imposing a timing limitation on use authorizations to mitigate vegetative disturbing activities during the core nesting season (May 15 to July 15) when most migratory birds nest, but cautioned that dates should be adjusted for the timing or intensity of breeding activity by BCC and migratory bird species affected by the Project and species' environmental conditions (BLM, 2007b). Brewer's sparrows are known to fledge young by August 6 (nest chronology data in Kingery, 1998).

Construction during the core nesting season (May 15 through July 15) could result in nest abandonment, displacement of birds and possible mortality of nestlings, more likely early in the nesting season (egg laying, incubation) than late in the season (Romin and Muck, 2002), although many species will re-nest at alternate sites if abandonment occurs early. Risk of mortality of nestlings and dependent fledglings is greater if adults abandon nests late in the season or if nests are destroyed prior to fledging young. Such risk could increase if predators were attracted to areas occupied by humans (Andren, 1994; Chalfoun et al., 2002). Use of corvid-proof containers for trash during construction activities would reduce predator-presence. It is suspected that nesting migratory birds would avoid adjacent functional habitats due to noise and activity associated with construction of the Indian Mesa Access Road and power line. Displacement/avoidance of these habitats is expected to be short-term with birds returning once noise from construction activities and human presence has left the area (Gilbert and Chalfoun, 2011). Additionally, noise produced by machinery and other human activities can interfere with bird vocalizations used for territory establishment, mate attraction and selection, food begging and predator alarms (Marler, 2004). Construction activities before May 15 or after July 15 would avoid the core migratory bird nesting period for most species but might affect late or second

nesting attempts. Take of active nests, if it occurred, would not be expected to have measurable negative effects on migratory bird populations.

Construction of the Indian Mesa Access Road and power line would affect 0.92 acre of potentially suitable migratory bird nesting habitat (saltbush desert shrublands); after construction approximately 0.39 acre of habitat would be revegetated within the 5-foot short-term right-of-way and power line right-of-way. This habitat is not expected to support nesting by BCC (e.g., Brewer's sparrow) and other migratory birds that have been observed in the Project Area; however, removal of saltbush desert shrublands could affect other migratory birds not observed during survey efforts that rely on this habitat type. Successful revegetation could occur within three growing seasons of construction, which could be expected to provide nesting and/or foraging habitat for some passerine migratory species. The Project could also affect bird species through degradation of nesting habitats due to noxious weed infestations that alter native vegetation cover and plant species composition.

Construction of the power line could affect migratory birds during flight. GVP would comply with "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006" that would minimize potential affects to birds utilizing the Project Area (see Avian Power Line Interaction Committee, 2006).

Produced water transported to the Disposal Facility is expected to be saline. Mortality of birds could occur. Migratory birds landing on salt water evaporation ponds elsewhere has led to salt encrustation of feathers, dehydration, toxicosis, and increased susceptibility to disease (avian botulism) (Windingstad et al., 1987; Wobeser, 1988; Meteyer et al., 1997). Ingested salt can also cause mortality in song birds (Bollinger et al., 2005). Netting the ponds would prevent these potential effects from occurring.

Protective/Mitigation Measures

In addition to protective/mitigation measures described above, the BLM would require the following protective/mitigation measure to further reduce effects to special status species:

- Clearing of vegetation on BLM-administered land should occur prior to May 15 or after July 15 to avoid take of migratory bird species, nests, eggs, unless survey indicates that none is present.
- All trash should be held in corvid-proof containers and removed from the Project Area each day during construction of the access road. Employees should be instructed to discard food or other trash in containers.

Recommended Protective/Mitigation Measures

BLM cannot require AES to apply protective/mitigation measures for construction on private lands. However, BLM recommends the following measures to minimize effects to migratory birds that could occur in the Project Area:

- BLM recommends that AES clear vegetation on private lands outside of the core migratory bird breeding season (May 15 through July 15) to avoid take of migratory bird species, nests, eggs.
- BLM recommends that AES consider netting the ponds to prevent mortality of migratory birds and other wildlife.

No Action Alternative

Under the No Action Alternative, impacts to migratory birds associated with the Proposed Action would not be caused because the Proposed Action would not be built. The existing DOE Access Road would continue to provide access to the DOE Cheney Site.

3.3.5.3 Finding on the Public Land Health Standard 3 (Migratory Birds)

Habitat degradation from invasive vegetative species could occur and could affect migratory birds in the Project Area. However, management of invasive and noxious weeds and timely reclamation of the disturbed area could help minimize effects on meeting Public Land Health Standard 3 in the Project Area. The Proposed Action would affect potentially suitable migratory bird nesting habitat (saltbush desert shrublands). Successful revegetation could occur within three growing seasons of construction, which could provide nesting and/or foraging habitat for some passerine migratory species. No changes in Land Health Standard 3 are anticipated under the Proposed Action if the design features and mitigation measures are properly implemented.

3.3.6 Wildlife (includes fish, aquatic and terrestrial) (includes a finding on Standard 3)

3.3.6.1 Current Conditions

Big Game. The Project Area coincides with CPW's Game Management Unit (GMU) 41. Mule deer, pronghorn, black bear, and cougar are big game species hunted within GMU 41 and have ranges that coincide with the Project Area. Elk are also hunted in GMU 41 but there are no seasonal ranges utilized by elk that coincide with the Proposed Action and elk are not discussed here.

The entire Project Area coincides with pronghorn overall range and pronghorn winter range. Winter ranges are utilized by 90 percent of the pronghorn population during an average five out of ten winters, generally from the first heavy snowfall to spring green-up. Wintering pronghorn concentrate in the vicinity of Cheney Reservoir, which serves as a perennial water source for wintering and summering animals. Cheney Reservoir is approximately 1.1 miles southeast of the Proposed Action. Pronghorn antelope are likely to be present on winter ranges from the first heavy snowfall (November or December) to spring green-up, usually in April to May.

GMU 41 is within Pronghorn Data Analysis Unit (DAU) A-27. Each DAU is a combination of one or more GMU and defines a relatively discrete population or herd. The population of pronghorn within DAU A-27 has been consistently small, estimated at approximately 60 animals since 2007 (CPW, 2012a). Consistent with the small population, less than two pronghorn per year, on average, were harvested in GMU 41 between 2000 and 2006 and only one pronghorn has been harvested with the GMU since 2007.

The Project Area also coincides with mule deer overall range utilized by deer in Mule Deer DAU D-12. Overall range is used by animals in the population during all seasons. According to CPW estimates (see CPW, 2012a), the post-harvest mule deer population in DAU D-12 has decreased between 2004 and 2010. The peak population was 33,190 mule deer in 2006 but was estimated to be 19,210 animals in 2011. Harvest data have been reported by CPW annually. Annual averages of 368 mule deer have been harvested within GMU 41 between 1999 and 2011 but there are no discernible trends for hunter success or hunter-days per animal harvested for mule deer during that period.

The entire Project Area coincides with habitats utilized by black bears (black bear overall range). Eight black bears, on average, have been harvested in GMU 41 each year since 2003 (CPW, 2014b). Human conflicts with bears are possible, although CPW (2012b) has noted that there are no areas of human-bear conflicts near the Project Area. The entire Project Area coincides with cougar (mountain lion) overall range. On average, 2.1 mountain lions have been harvested annually in GMU 41 since 2002 (CPW, 2014b). Human conflicts with cougars have been documented in the region (in residential/agricultural land proximate to Kannah Creek) and

may have included attacks on humans, predation on domestic pets, or depredation on livestock near human habitation (see mountain lion metadata in CDOW, 2012b).

Small Game/Upland Game. Harvest of small game, including furbearers, is compiled by county rather than by GMU. During the 2010/2011 harvest year, eight small game species were harvested in Mesa County, of which only four species are likely to occur in the Project Area: cottontails (desert cottontail and mountain cottontail), coyote, Gambel's quail and mourning dove. Bird species are harvested as small game in Mesa County, including ring-necked pheasant, Gambel's quail, mourning doves, and blue (dusky) grouse. Habitat for cottontails, jackrabbits, white-tailed prairie dogs, and mourning doves is present in vicinity of the Proposed Action.

Other game birds in the region include wild turkey and various waterfowl, including ducks and geese. No suitable habitat for wild turkey is present but waterfowl habitat occurs along the Gunnison River, approximately four miles from the Project Area, and possibly at Cheney Reservoir, 1.1 miles to the southeast.

Non-game Wildlife. The habitat present within the Project Area could support a variety of non-game wildlife including amphibians, reptiles, birds, and mammals. CPW (2014c) lists 405 wildlife species expected to occur in Mesa County. Of those, 323 species would be classified as non-game (not legally harvested or identified as sensitive by state and/or federal agencies). Most non-game species are likely to occur within shrub-dominated wetland and/or riparian habitat. The least number of species is expected to be associated with Developed lands, which include roads and other disturbed ground surfaces in and around the Project Area.

Fish and Other Aquatic Species. Indian Creek that is crossed by the existing DOE Access Road, and located approximately 360 feet west-southwest of the Disposal Facility boundary is a tributary to Kannah Creek, which flows into the Gunnison River located approximately 8 miles downstream from the DOE Access Road crossing. There is no information about whether or not fish occur in Indian Creek. Indian Creek is likely intermittent and is assumed to not support fish.

Native fish species occur in Kannah Creek, a perennial stream approximately 4 miles downstream of the Project Area. Fish species likely present in Kannah Creek, based on samples from the Gunnison River in the vicinity of Whitewater in 1996 include (Deacon and Mize, 1997): white sucker, bluehead sucker, flannelmouth sucker, roundtail chub, speckled dace and fathead minnows. Non-native species observed include rainbow trout, brown trout, and common carp. None of these species are expected within the Project Area.

Public Land Health Standard 3 (Terrestrial Wildlife)

Standard 3: Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential.

The BLM assessed Land Health Standard 3 within the Project Area in the Kannah Creek Common Allotment (BLM, 2010) in the Project Area (see discussion for Vegetation, above). In the Kannah Creek Common Allotment (3,931 acres evaluated), 14 percent of the area were meeting land health standards, 63 percent were meeting standards but with problems, and 23 percent were not meeting standards. Loss of plant diversity, absence of perennial grasses, and dominance of invasive non-native species has created a degraded habitat for wildlife in the Project Area.

3.3.6.2 Environmental Consequences

Construction and operation of the Proposed Action could directly and/or indirectly affect terrestrial wildlife present in the Project Area through one or more of the following pathways:

- Direct mortality by vehicles during construction and operation.
- Removal and alteration of vegetation composition and structure of existing habitats, making them less functional for wildlife.
- Displacement of animals to alternative habitats.

Construction of the Indian Mesa Access Road and power line would remove and alter habitats used by wildlife. Approximately 0.92 acre would be removed for construction of the access road and power line, of which approximately 0.39 acre would be revegetated and restored after construction. Removal of such a small portion of available habitat, which is located adjacent to the existing DOE Access Road, should not affect terrestrial wildlife utilizing the Project Area. Spread of noxious weeds can further reduce wildlife habitat. AES conducted surveys for noxious weeds and would treat and monitor noxious weeds to minimize effects to wildlife habitat adjacent to the Indian Mesa Access Road.

During construction of the Proposed Action, terrestrial wildlife species would potentially be displaced from habitats in the vicinity of construction activities; however, displacement should be a short-term effect related to noise and human presence during construction. Displaced individuals are expected to return once human activity is absent or reduced during operation of the Disposal Facility.

Presence of garbage can attract black bears and could result in additional bear-human conflicts. The use of bear-proof containers would reduce this potential effect.

Once the Proposed Action has been constructed, traffic on the access road could result in mortality or injury to various wildlife species during construction and operation of the Disposal Facility. Species most susceptible to vehicle-related mortality include those that are inconspicuous (lizards, snakes, and small mammals), those with limited mobility, burrowing species (mice and voles), wildlife with behavioral activity patterns (i.e., nocturnal activity) making them vulnerable, and birds that may get flushed by traffic (Leedy, 1975; Bennett, 1991; Forman and Alexander, 1998). Not exceeding 30 mph should reduce the potential for vehicle collisions with terrestrial wildlife (see Protective/Mitigation Measures in Air Quality section). Any mortality or injury to various wildlife species would not affect the overall population.

Construction of the Disposal Facility could directly affect wildlife species if they inhabit the private parcel. Similar to discussions above for the Proposed Action, wildlife could be displaced from habitat cleared of vegetation. Displacement would likely be a long-term effect once construction of the Disposal Facility is complete. AES would erect a wildlife-friendly fence around the perimeter of the Disposal Facility that would exclude cattle, but not prevent wildlife to access the Disposal Facility property. Proposed components within the Disposal Facility (evaporation ponds, landfill, and land-farm) could affect wildlife that enter the Disposal Facility boundary through a variety of mechanisms. Produced water transported to the Disposal Facility is expected to be saline. Ingested salt can cause mortality in small and large mammals (Bollinger et al., 2005). No deterrents have been identified for the Disposal Facility that would reduce potential effects to wildlife. Erecting a wildlife exclusion fence along the perimeter of the Disposal Facility boundary and/or netting the evaporation ponds could prevent potential effects to wildlife entering the Disposal Facility boundary from occurring.

No habitat for aquatic species is present within the Project Area; therefore, no effects to aquatic resources are expected.

Protective/Mitigation Measures

In addition to the protective measures described above, the BLM would require the following protective/mitigation measures to further reduce effects to terrestrial wildlife:

- During construction of the Indian Mesa Access Road and power line, AES should use bear-proof containers and collect refuse frequently to minimize potential for conflicts on construction sites.

Recommended Protective/Mitigation Measures

BLM cannot require AES to apply protective/mitigation measures for construction on private lands. However, BLM recommends the following measures to minimize effects to terrestrial wildlife that could occur in the Project Area:

- BLM recommends that AES erect wildlife exclusion fences along the perimeter of the Disposal Facility to prevent wildlife from entering the facility.
- BLM recommends that AES consider netting the ponds to prevent mortality of wildlife.

No Action Alternative

Under this alternative, there would be no effects to wildlife resulting from construction and operation of the access road. The existing DOE Access Road would continue to provide access to the DOE Cheney Site.

3.3.6.3 Finding on the Public Land Health Standard 3 (Terrestrial Wildlife)

Effects to the Project Area landscape have mainly been from past and present grazing practices, drought, and surface disturbances associated with oil and gas. Habitat loss and degradation could occur from the proposed action and could affect wildlife in the Project Area. However, management of invasive and noxious weeds and timely reclamation of the disturbed area could help minimize effects to the area's capacity to meet Public Land Health Standard 3. No changes in Land Health Standard 3 are anticipated under the Proposed Action if the design features and mitigation measures are properly implemented.

3.4 HERITAGE RESOURCES AND HUMAN ENVIRONMENT

3.4.1 Cultural Resources

3.4.1.1 Current Conditions

The BLM manages cultural resources in accordance with the Antiquities Act of 1906, National Historic Preservation Act (NHPA) of 1966, Native American Graves Protection and Repatriation Act of 1990, the Archaeological Resources Protection Act of 1979, and various other laws and Executive Orders. The management process is also governed by the Colorado BLM's Protocol with the State Historic Preservation Officer (SHPO), implementing the BLM's National Programmatic Agreement with the Advisory Council on Historic Preservation.

In 2010, archaeologists with GRI conducted a file search and Class III cultural resource inventory for the proposed Indian Mesa Access Road and power line on 4 acres of BLM-administered land (BLM Ref. No. 1110-04 – Conner, 2010 – OAHP No. ME.LM.R645). The file search revealed that 14 other cultural resource surveys have been conducted within approximately one mile of the Project Area, including two for the existing DOE Access Road. These past surveys recorded 43 cultural resources within one mile of the Project Area. Of these, eight are prehistoric sites, one is an historic road/trail, and the others are isolated finds. By law, isolated finds are not eligible for inclusion in the National Register of Historic Places (NRHP).

In compliance with the NHPA, the Class III inventory included a two-person pedestrian survey walking north-south transects spaced about 15 meters apart, covering an area approximately

200 feet by 875 feet. As expected, the area contains limited resources because of the barren, open terrain. Two isolated finds (utilized flakes) were recorded in survey ME.LM.R645.

In 2013, GRI conducted an intensive Class III cultural resources inventory of the 160-acre parcel of private land proposed for the Disposal Facility (CRIR No. 1113-05 – OAHF ME.LM.R843 - Conner et al., 2013). The inventory was undertaken to ensure compliance with federal legislation governing the identification and protection of cultural resources. The inventory recorded one historic campsite (5ME19667), two prehistoric open lithic sites (5ME19666 and 5ME19668), and five isolated finds (5ME19669 through 5ME19673) within the 160-acre survey block. Because no clearly chronometrically diagnostic artifacts were located during the inventory, little is known about the period of occupation of the sites. The character of the sites and the high incidence of isolated finds suggest that the area was used for resource procurement for limited periods of time. All the sites have been determined to be officially not eligible for NHRP listing through consultation with the SHPO.

3.4.1.2 Environmental Consequences

Activities that could result in direct effects to cultural resources include general surface disturbance associated with construction of the Indian Mesa Access Road and power line on BLM-administered lands, and construction of the Disposal Facility on private lands. These physical impacts could also result in the discovery of unanticipated archaeological deposits. Unanticipated discoveries can result in displacement or loss (either complete or partial) of the located resources. Potential indirect effects could include vandalism, inadvertent damage, and illegal artifact collection due to increased numbers of people in the Project Area. However, based on past and recent cultural resource inventories, the potential for additional and unexpected discoveries remains low.

Although the construction of the Disposal Facility on private lands would directly impact not eligible sites 5ME19667, 5ME19666, and 5ME19668, the sites are not considered to be significant cultural resources.

Protective/Mitigation Measures

To protect any cultural resources that may be present in the Project Area but unknown to the Agency (BLM), the following would apply:

- All persons in the area who are associated with this project shall be informed that any person who, without a permit, injures, destroys, excavates, appropriates or removes any historic or prehistoric ruin, artifact, object of antiquity, Native American remains, Native American cultural item, or archaeological resources on public lands is subject to arrest and penalty of law (16 USC 433, 16 USC 470, 18 USC 641, 18 USC 1170, and 18 USC 1361). Strict adherence to the confidentiality of information concerning the nature and location of archeological resources would be required of the proponent and all of their subcontractors (Archaeological Resource Protection Act, 16 U.S.C. 470hh).
- Inadvertent Discovery: The National Historic Preservation Act (NHPA) [16 USC 470s., 36 CFR 800.13], as amended, requires that if newly discovered historic or archaeological materials or other cultural resources are identified during the Proposed Action implementation, work in that area must stop and the BLM Authorized Officer (AO) must be notified immediately. Within five working days the AO will determine the actions that will likely have to be completed before the site can be used (assuming in place preservation is not necessary).

- The Native American Graves Protection and Repatriation Act (NAGPRA) [25 USC 3001 et seq., 43 CFR 10.4] requires that if inadvertent discovery of Native American Human Remains or Objects of Cultural Patrimony occurs, any activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice be made to the BLM Authorized Officer, as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA Section 3(d)).
- The operator may relocate activities to avoid the expense of mitigation and delays associated with this process, as long as the new area has been appropriately inventoried and has no resource concerns, and the exposed materials are recorded and stabilized. Otherwise, the operator shall be responsible for mitigation costs. The BLM authorized officer will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM authorized officer that the required mitigation has been completed, the operator will be allowed to resume construction.
- Antiquities, historic ruins, prehistoric ruins, and other cultural or paleontological objects of scientific interest that are outside the authorization boundaries but potentially affected, either directly or indirectly, by the proposed action shall also be included in this evaluation or mitigation. Impacts that occur to such resources as a result of the authorized activities shall be mitigated at the operator's cost, including the cost of consultation with Native American groups.

No Action Alternative

Under this alternative, there would be no effects to historic properties.

3.4.2 Paleontological Resources

3.4.2.1 Current Conditions

Paleontological resources include the remains or traces of any prehistoric organism preserved by natural processes in the earth's crust. The BLM manages paleontological resources for their scientific, educational and recreational values in compliance with the Antiquities Act of 1906 and the Paleontological Resources Preservation Act (PRPA) of 2009.

The BLM classifies geologic formations to indicate the likelihood of scientifically significant fossil occurrence according to the Potential Fossil Yield Classification System (PFYC) for Paleontological Resources on Public Lands (BLM, 2007c). These classifications determine the procedures to be followed prior to granting paleontological clearance for a Proposed Action.

Geologic maps indicate that the Project Area is underlain by Quarternary gravels and alluvium, and Cretaceous shales/sandstones. For these geologic strata, the BLM assigns PFYC Class 3, which means there is a moderate or unknown probability of fossil occurrence. No known fossil localities occur in the Project Area. The BLM GJFO does not require paleontological surveys prior to surface disturbance in areas underlain by Mancos Shale and gravel and alluvium (Gerwe, 2010).

3.4.2.2 Environmental Consequences

Surface disturbance has the potential to adversely affect scientifically important fossils. Direct effects would include damage or destruction of scientifically significant fossils during construction, with subsequent loss of information. Indirect effects would include fossil damage or destruction by erosion due to surface disturbance. Because of the surficial geology underlying Proposed Action and the known scarcity of resources in the area, direct and/or indirect effects to paleontological resources are not anticipated.

Protective/Mitigation Measures

In addition to protective/mitigation measures described above, the BLM would require the following protective/mitigation measure to reduce effects to paleontological resources:

- If paleontological resources are documented during construction of the Indian Mesa Access Road and power line, AES should suspend construction until written authorization to proceed is issued by the BLM AO.

No Action Alternative

There would be no effects to paleontological resources under this alternative.

3.4.3 Tribal and Native American Religious Concerns

3.4.3.1 Current Conditions

American Indian religious concerns are legislatively considered under several acts and Executive Orders, namely the American Indian Religious Freedom Act of 1978 (PL 95-341), the Native American Graves Environmental Assessment Protection and Repatriation Act of 1990 (PL 101-601), and Executive Order 13007 (1996; Indian Sacred Sites). In summary, these require, in concert with other provisions such as those found in the NHPA and ARPA, that the federal government carefully and proactively take into consideration traditional and religious Native American culture and life and ensure, to the degree possible, that access to sacred sites, the treatment of human remains, the possession of sacred items, the conduct of traditional religious practices, and the preservation of important cultural properties are considered and not unduly infringed upon. In some cases, these concerns are directly related to “historic properties” and “archaeological resources”. In some cases, elements of the landscape without archaeological or other human material remains may be involved. Identification of these concerns is normally completed during the land use planning efforts, reference to existing studies, or via direct consultation.

Eight cultural resources were located during the field inventory, but they are not of a type that has been identified in previous consultation as site types of concern. If there are sites of religious concern that are unknown to the agency (BLM), the Project would not alter or limit any access to these properties beyond the current access availability. Native American Indian consultation was conducted for the proposed undertaking in January of 2014. Consultation was conducted in with the Ute Indian Tribe of the Uintah and Ouray Reservation (UIT), the Southern Ute Indian Tribe (SUIT), and the Ute Mountain Ute Tribe (UMUT) and a response was received from the SUIT that they felt that the Project would have no adverse effects. Responses were not received from the UIT or the UMUT.

3.4.3.2 Environmental Consequences

Proposed Action Alternative

The Ute have a generalized concept of spiritual significance that is not easily transferred to Western models or definitions. As such, the BLM recognizes that the Ute have identified sites that are of concern because of their association with Ute occupation of the area as part of their traditional lands. No traditional cultural properties, unique natural resources, or properties of a type previously identified as being of interest to local tribes, were identified during the cultural resources inventory of the Project Area. There is no other known evidence that suggests that the Project Area holds special significance for Native Americans. If new information is provided by Native Americans during the EA process, additional or edited terms and conditions for mitigation may have to be negotiated or enforced to protect resource values.

Protective/Mitigation Measures

None.

No Action Alternative

There would be no effects to Tribal and Native American Religious resources under this alternative.

3.4.4 Socioeconomics

3.4.4.1 Current Conditions

The Project Area is located in Mesa County, which is the largest population center in Northwest Colorado, and a hub of regional economic activity. Led by an expanding energy industry, particularly natural gas and oil development, the economy of this mostly rural region of the state has expanded rapidly since 2000. Many of the service industries that support the energy sector are based in Mesa County. The Project Area is located in a rural region of southern Mesa County, approximately 8 miles south of the unincorporated community of Whitewater and approximately 1 mile east of the U.S. Highway 50 corridor. The area surrounding the Project Area includes rangeland and the DOE Cheney Site Disposal Site. With the exception of the DOE Cheney Site, there are no residences or other facilities within 2 miles of the Project Area.

Between 1990 and 2000, Mesa County's population increased by an average of 2.6 percent per year, from 93,145 in 1990 to 117,651 in 2000. The county's population increased to 146,587 in 2010, for an average annual growth rate of 2.5 percent between 2000 and 2010. The rate of population growth has slowed in recent years; the county's 2012 population of 148,013 reflects an average annual growth rate of 0.5 percent between 2010 and 2012 (Colorado Department of Local Affairs - CDOLA, 2014a). Robust job growth resulted in low unemployment in Mesa County for much of the 2000's. Reflecting the national economic downturn that began in 2008, unemployment in Mesa County began to increase in late 2008 and peaked at 10.7 percent in 2010. In 2013, the county had an 8.1 percent unemployment rate (Bureau of Labor Statistics, 2014). Annual wages in Mesa County averaged \$39,728 in 2013. Average annual wages were highest in the management of companies and enterprises (\$101,556), mining (\$76,648), and utilities sectors (Colorado Department of Labor and Employment, 2014). Over the past decade the total assessed value of taxable property in Mesa County more than doubled, increasing from \$807 million in 2000 to \$1.8 billion in 2013 (CDOLA, 2014b). Since 2000, the composition of the county's property tax base has shifted to include a greater contribution from oil and gas properties.

3.4.4.2 Environmental Consequences

Proposed Action Alternative

Given the low employment levels, the use of local workers, and the relatively short construction schedule, construction of the Proposed Action would not affect population or employment trends in Mesa County. Due to the low level of employment, operation of the Proposed Action would not affect population or employment trends in Mesa County either.

Contributions to overall tax revenues to Mesa County government would be minimal as a result of construction of the Indian Mesa Access Road and construction and operation of the Disposal Facility. The impact on public infrastructure such as the Mesa County Sheriff's Office and the Land's End File Protection District would also be minimal.

Because of its location adjacent to the DOE Cheney Site, which has been operating since 1998, the Proposed Action would not impact the social characteristics or rural nature of the surrounding area. Due to the absence of nearby residences, the Proposed Action would have minimal impacts on residents of southern Mesa County.

Protective/Mitigation Measures

No protective/mitigation measures have been identified by the BLM for social and economic effects.

No Action Alternative

There would be no potential effects to socioeconomic resources under the No Action Alternative.

3.4.5 Environmental Justice

3.4.5.1 Current Conditions

Executive Order 12898 requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies and activities on minority and low-income populations. According to the U.S. Census Bureau's *2012 American Community Survey*, racial minorities, including Black/African-American, American Indian, Alaska Native, Asian, Native Hawaiian, other Pacific Islanders, "other" races, and multi-racial, comprised 15.6 percent of Colorado's statewide population and 7.7 percent of Mesa County's population between 2008 and 2012. During this time, persons of Hispanic origin, who may be of any race, comprised 21.0 percent of Colorado's population and 13.7 percent of Mesa County's population (Census Bureau, 2013a).

The Census Bureau defines low-income populations as individuals whose income during the previous 12 months fell below the poverty level. According to the Census Bureau's Small Area Income and Poverty Estimates database, in 2012, low income populations comprised 13.6 percent of Colorado's population and 15.1 percent of Mesa County's population (Census Bureau, 2013b).

3.4.5.2 Environmental Consequences

The potential for environmental justice impacts was evaluated using the Council on Environmental Quality's "meaningfully greater" criterion population analysis in which minority and low-income populations in Mesa County were compared to statewide reference populations (Council on Environmental Quality, 1997). Minority and low-income populations equal to or greater than 120 percent of the statewide relevant population were considered to be "meaningfully greater" populations that could be disproportionately impacted by the Proposed Action's potential effects. The 120 percent criterion level was selected because it is commonly used for NEPA compliance by federal agencies.

Overall, Mesa County contains lower portions of racial minority and Hispanic populations than the state as a whole. Although the county contains a higher portion of low-income populations as compared to the state, the difference is not large enough to be considered meaningfully greater. Therefore, the Proposed Action is not expected to disproportionately affect minority or low-income populations.

Protective/Mitigation Measures

No protective/mitigation measures have been identified by the BLM for environmental justice impacts.

No Action Alternative

There would be no potential effects to minority or low-income populations under the No Action Alternative.

3.4.6 Transportation/Access

3.4.6.1 Current Conditions

U.S. Highway 50 would be the primary highway used to access the Disposal Facility. Project traffic would exit U.S. Highway 50 onto the DOE Access Road, an existing improved paved road on BLM-administered lands. The DOE Access Road is currently used as a service road for operations at the DOE Cheney Site and the public does not have access. Average annual daily traffic (AADT) traffic on U.S. Highway 50 between milepost 45 and milepost 59 (Colorado Department of Transportation -CDOT Station ID 101080) included 7,800 vehicles per day in 2013 (Colorado Department of Transportation - CDOT, 2014). Existing traffic on the DOE Access Road is irregular, and includes service and maintenance vehicles accessing the DOE Cheney Site and occasional recreational traffic accessing surrounding BLM lands.

3.4.6.2 Environmental Consequences

Under the Proposed Action, project-related traffic would exit U.S. Highway 50 approximately 4 miles north of the Delta County border onto the DOE Access Road. Project traffic would travel east for approximately 1.0 mile on the DOE Access Road, which was upgraded in 2012, and turn right (south) onto the proposed Indian Mesa Access Road, a new 730 foot road leading to the Disposal Facility. Public access will not change with upgrading of the DOE Access Road and construction of the new road; the public will not have access.

Traffic associated with construction of the Indian Mesa Access Road and power line would be short-term, taking approximately 2 weeks to complete; construction of the first phase of the Disposal Facility would take approximately 3 months. Construction traffic is estimated to peak at 107 vehicles per day, which would result in less than 1 percent increase in traffic on U.S. Highway 50 compared to 2013 traffic levels. Traffic associated with operation of the Disposal Facility would be on-going and is estimated to peak at 56 vehicles per day, which would result in an approximate 1.5 percent increase in traffic on U.S. Highway 50 compared to 2013 traffic levels. Project traffic would result in a noticeable increase in traffic on the DOE Access Road compared to current levels.

Additional traffic-related effects associated with the Proposed Action would include increased road deterioration and an increase in maintenance requirements, increased dust on unpaved roads, and increased opportunities for vehicular crashes. Observance of highway safety rules, regulations, and safe driving practices would reduce the potential for crashes.

Protective/Mitigation Measures

The BLM has identified the following protective/mitigation measures to reduce impacts to Transportation and Access:

- Twelve inches of Class 6 rock should be used rather than 6 inches. Four inches of overlay gravel may be inadequate and may need to be adjusted when truck traffic begins.
- Roads should be properly maintained to minimize erosion, especially during storm events. No “wet blading” should be allowed. During dry periods, watering of roads may be necessary during facility use.

No Action Alternative

Under the No Action Alternative, vehicles would continue to use U.S. Highway 50 and the DOE Access Road to access the DOE Cheney Site. There would be no additional effects to transportation and access due to the Proposed Action.

3.4.7 Wastes, Hazardous or Solid

3.4.7.1 Current Conditions

BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all NEPA documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. These practices are dictated by various federal and state laws and regulations, and the BLM standard terms and stipulations which would accompany any authorization resulting from this analysis.

Hazardous materials are defined by the BLM as any substance, pollutant, or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 42 United States Code - USC 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 USC 9601 et seq., and its regulations. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101(14), 42 USM 9601 (14), nor does the term include natural gas.

3.4.7.2 Environmental Consequences

Proposed Action Alternative

Gasoline and diesel fuels would be used during construction of the Proposed Action. Fuels used in the construction of the Proposed Action would be kept within the boundaries of the Disposal Facility on private lands in limited quantities. Refueling of equipment would occur within the Disposal Facility boundary. Impacts from hazardous materials could result from accidental spills of hazardous materials but events would be localized. Proper containment of oil and fuel in storage areas would minimize potential surface water and groundwater contamination. Hazardous materials would also be stored within the Disposal Facility boundary on private lands and would not be stored along the right-of-way. All wastes would be disposed of in accordance with federal, state, and local regulations.

Emergency response to hazardous materials or petroleum products spilled on BLM-administered lands would be addressed through the BLM.

Protective/Mitigation Measures

In addition to protective/mitigation measures described above, the BLM would require the following protective/mitigation measure to further reduce effects from wastes, hazardous or solids:

- Fueling and maintenance activities should occur at least 300 feet from waterbodies.
- Any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 will be reported per the Comprehensive Environmental Response Compensation and Liability Act of 1980, Section 102b (CERCLA). Copies of any report to any Federal agency or State government as a result of a reportable release/ spill of any toxic substances will be furnished to the BLM, concurrent with the filing of the reports to any Federal agency or State government.

No Action Alternative

There would be no effects from hazardous or other wastes under this alternative. The existing DOE Access Road would continue to provide access to the DOE Cheney Site.

3.5 LAND RESOURCES

3.5.1 Range Management

3.5.1.1 Current Conditions

On BLM-administered lands, the Proposed Action would cross the Kannah Creek Common grazing allotment. The allotment has several designated periods of use for cattle grazing and/or trailing scheduled throughout the year, with a range of about 100 to 550 cattle occupying the allotment. The total size of Kannah Creek allotment is approximately 34,103 acres (4,466 of which is on private land), providing for 1,580 total active animal unit months (AUMs). Typically, BLM grazing allotments encompass both public and private lands, but only public lands are included in determining active AUMs.

3.5.1.2 Environmental Consequences

Proposed Action Alternative

Effects to grazing resources under the Proposed Action would be the result of surface disturbance (forage removal) and increased vehicle traffic. Surface disturbing effects would occur on 0.92 acre of BLM-administered land in the Kannah Creek Common allotment. After construction of the Indian Mesa Access Road and power line, approximately 0.39 acre of the short-term right-of-way and power line right-of-way would be restored to pre-construction conditions and would be available for forage. It is expected that revegetation would be successful 5 years after reclamation. Whether or not cattle grazing continues in the Kannah Creek Allotment in the Project Area, effects to AUMs in the allotment would be negligible.

Traffic on the existing paved DOE Access Road could increase the risk of injury or death to grazing cattle in the Project Area; however, limiting speeds during construction, operation, and night use would reduce this risk.

The Disposal Facility property would be completely fenced to exclude cattle; no activities within the boundary of the Disposal Facility would be expected to affect grazing activities within the Kannah Creek Common allotment.

Protective/Mitigation Measures

The BLM has identified the following protective/mitigation measures to reduce impacts to Range Management:

- If livestock is observed travelling up the existing DOE Access Road and into areas between fences, additional fencing should be added so that livestock cannot travel into narrow pathways where they could become stuck.

No Action Alternative

There would be no effects to range management under this alternative. The existing DOE Access Road would continue to provide access to the DOE Cheney Site.

3.5.2 Fire and Fuels

3.5.2.1 Current Conditions

The GJFO manages wildland fire using a multidisciplinary approach under the guidelines found in two sets of interagency frameworks: the broader, directive Guidance for Implementation of Federal Wildland Fire Management Policy (Fire Executive Council, 2009) and the regional GJFO/Colorado National Monument Interagency Fire Management Plan (IFMP) (BLM, 2008b). GJFO wildland fire and fuels management reflects a consideration of fire history, land status, public concerns and issues and other resource objectives (BLM, 2008b).

The Proposed Action is located in the IFMP Whitewater Desert FMU, consisting of Category A management prescription. Category A units are areas where fire is not desired at all. These units are further described as areas where mitigation and suppression is required to prevent direct threats to life or property. It includes areas where fire did not play a large role in the development and maintenance of the ecosystem, or because of human development, fire can no longer be tolerated without significant loss (BLM, 2008b).

3.5.2.2 Environmental Consequences

Proposed Action Alternative

AES would comply with all federal, state, and local laws, ordinances, and regulations that pertain to the prevention, pre-suppression, and suppression of fires. If wildfires are observed near or in the Project Area, they would be reported immediately to the nearest fire dispatch office (Lands End Fire Department) as noted in the POD.

Protective/Mitigation Measures

There are no additional protective/mitigation measures to further reduce effects to fire and fuels management.

No Action Alternative

There would be no effects to fire and fuels management under this alternative. Activities would continue at the DOE Cheney Site.

3.5.3 Land Tenure, Rights of Way and other Uses

3.5.3.1 Current Conditions

The Project would be located on both federal lands administered by the BLM GJFO and private lands. The following is a list of the authorized rights-of-way in the Project Area that could be directly or indirectly affected (BLM, 2014):

Rights-of-way directly affected:

COC043106	Department of Energy	Access road to DOE Cheney Site
COC050800	Grand Valley Rural Power	Power transmission line to the existing DOE Cheney Site

Other rights-of-way in the vicinity of the proposed action:

COC029423	Public Service of CO	Transmission Line
COC040209	Grand Valley Rural Power	Power transmission Line
COC051280	TransColorado Gas	Natural Gas pipeline
COC055949	Qwest Corp.	Telephone line
COC062675	Brand	Access Road
COC063427	Tri-State Gen & Tran	Fiber Optic Facilities
COC0015543	CO Dept. of Transportation	Highway 50
COC0122132	Denver S Park & Pacific RR	Railroad

3.5.3.2 Environmental Consequences

Proposed Action Alternative

AES proposes to share the existing rights-of-way for access and utilities with the DOE: COC043106 and COC050800. AES would ensure that the DOE Cheney Site included in the existing ROW Grant would be accessible during construction of the new Indian Mesa Access Road and overhead power line to the Disposal Facility. The proposed electrical line would be a private line for Indian Mesa Inc. constructed from the Grand Valley Power overhead electrical line that serves the existing DOE Cheney Site. No construction impacts outside of the extent of the proposed ROW are anticipated.

The DOE utilized the CDOT right-of-way on U.S. Highway 50 to transport mill tailings to the disposal cell in semi-trucks similar in size and weight to the proposed Indian Mesa waste delivery vehicles. Based on this history, it is anticipated the exit crossing is structurally sufficient to handle the proposed Indian Mesa Disposal Facility traffic and additional work within the CDOT right-of-way (COC0015543) would not be required.

No additional activities in the surrounding area are anticipated that would affect the other rights-of-way.

Protective/Mitigation Measures

The BLM has identified the following protective/mitigation measures for Land Tenure, Rights of Way, and Other Uses:

- At least 90 days prior to termination of the ROW, AES should contact the Authorized Officer to arrange a joint inspection of the right-of-way. This inspection will be held to agree to an acceptable termination and rehabilitation plan. This plan should include, but is not limited to, removal of facilities, drainage structures, removal of surface material; re-contouring, top-soiling, or seeding. The Authorized Officer must approve the plan in writing prior to the holder's commencement of any termination activities.
- AES should conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the ROW.

No Action Alternative

There would be no effects to realty authorizations under this alternative.

CHAPTER 4 – CUMULATIVE EFFECTS

Cumulative effects are defined in the CEQ regulations (40 CFR § 1508.7) as “the impact on the environment that results from the incremental impact of the action when added to other past, present and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions.” Cumulative effects analysis typically encompasses broader areal and time frames than analysis of direct and indirect effects. The actions and effects selected for analysis depend on access to reasonably available data. The cumulative analysis for the Proposed Action is tiered to the cumulative analysis completed for the Fram Whitewater Unit Master Development Plan Environmental Assessment (DOI-BLM-CO-130-2012-0003-EA) in June 2014; that analysis is summarized but not fully repeated within this EA.

Generally, past and ongoing activities (natural and man-made) that have affected and are affecting the Project Area and surrounding areas include:

- mining;
- oil and gas exploration and development;
- rights-of-way or other land uses (power lines, pipelines, roads);
- wildland fire;
- drought;
- wildlife utilization;
- climate change;
- livestock grazing;
- dispersed recreation (i.e., hunting, camping, etc.); and
- off-highway vehicle (OHV) use.

For this analysis, foreseeable actions are considered to be limited to those for which some formal notice or permit application has been made and do not include potential developments which are speculative. Those foreseeable actions analyzed in the Draft RMP were reviewed and included in this analysis, where applicable. Disturbance from the Proposed Action is included in foreseeable actions.

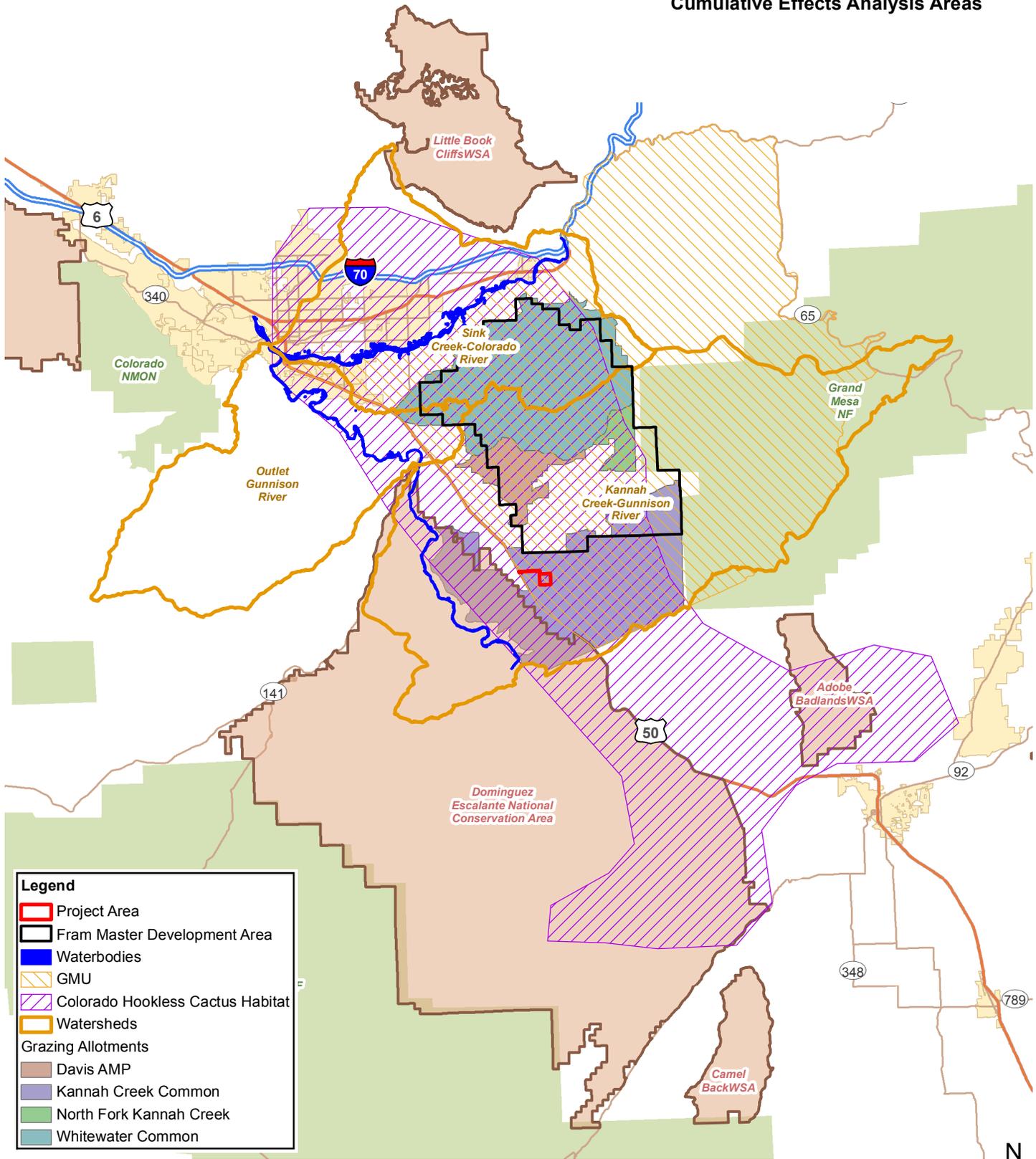
The geographic scope used for analysis varies for each cumulative effects issue. The areas to be analyzed for cumulative effects have been selected based on several criteria. Because of the complexity of analyzing impacts to multiple resources from multiple sources, common analysis areas have been used for different resources, where such use is logically defensible. The Cumulative Effects Analysis Areas (CEAAs) selected for each analyzed resource and the rationale for their selections are described in Table 4.0-1 and shown on Map 4.0-1.

Levels of surface disturbance are used as a best estimate for total impacts to the human environment (see Table 4.0-2). The rationale is that levels of surface disturbance are among the most comprehensive and readily determined impacts and because disturbance to the surface results in direct and indirect effects to many analyzed resources.

For several resources, there either are no cumulative effects or they are expected to be similar to those described for the Proposed Action (Cultural, Paleontological Resources, Native American Religious Concerns, Socioeconomics, Environmental Justice, Areas of Special Designations, Fire and Fuels, Land Tenure). Resources for which cumulative effects may occur are described below.

Map 4.0-1

Cumulative Effects Analysis Areas



Legend

- Project Area
- Fram Master Development Area
- Waterbodies
- GMU
- Colorado Hookless Cactus Habitat
- Watersheds
- Grazing Allotments**
- Davis AMP
- Kannah Creek Common
- North Fork Kannah Creek
- Whitwater Common



No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by the BLM



**Table 4.0-1
Cumulative Effects Analysis Area Rationale by Resource (excerpted from Table 4.3-1 of the Fram Whitewater EA)**

Resource	Cumulative Effects Analysis Area	CEAA Area (Acres)	Rationale
PHYSICAL RESOURCES			
Air Quality	Domain extending 100 km from Project Area including all of the GJFO	N/A	Direct impacts from the Proposed Action would not cause an exceedance of any ambient air quality standard and would not exceed the Prevention of Significant Deterioration Increments within the modeling domain. In addition direct Project impacts to AQRVs (visibility, atmospheric deposition and potential sensitive lake acidification) would be below threshold values at all Class I and sensitive Class II areas with the domain.
Soil Resources	Sink Creek-Colorado River, Gunnison River Outlet and Kannah Creek-Gunnison River 5th-level Watersheds ¹	294,547	All Project disturbance would occur within portions of these watersheds. Soil transport would be downstream within the watersheds.
Hydrology	Sink Creek-Colorado River, Gunnison River Outlet and Kannah Creek-Gunnison River 5th-level Watersheds ¹	294,547	All Project surface water flow would be within these watersheds. The watersheds also contain the local water wells, which are largely developed in alluvial aquifers.
BIOLOGICAL RESOURCES			
Invasive, Non-native Species and Vegetation	Sink Creek-Colorado River, Gunnison River Outlet and Kannah Creek-Gunnison River 5th-level Watersheds ¹	294,547	Dispersal of invasive seeds from the Project and transport into the Project Area would be contained within the watersheds. The combined watershed is of sufficient size to contain most local cumulative impacts to vegetation subject to GJFO jurisdiction and the CEAA matches that used for analysis of soils impacts.
Special Status Animal Species	Sink Creek-Colorado River, Gunnison River Outlet and Kannah Creek-Gunnison River 5 th level Watersheds	294,547	The CEAA encompasses all Project disturbances as well as local reaches of streams potentially containing representatives of the federally listed Colorado River fish species. It is of sufficient size to represent habitats of non-listed local sensitive species. The CEAA is that used for vegetation, which includes the various habitats for local migratory bird populations.
Special Status Plant Species	Southern population of <i>S. glaucus</i> ³	259,152	The CEAA encompasses all known populations and likely habitat for the federally listed plant species which may occur within the vicinity of the Project and is of sufficient size to represent habitats of non-listed local sensitive species.
Wildlife	CPW GMU 41 ²	209,983	The CEAA includes the range of local big game species and encompasses the local range of smaller, less mobile, species.

Resource	Cumulative Effects Analysis Area	CEAA Area (Acres)	Rationale
HERITAGE RESOURCES AND HUMAN ENVIRONMENT			
Transportation and Access	Mesa County	2,140,818	The CEAA for transportation and access includes substantially all of the road network which would be used to access the Project.
Wastes, Hazardous or Solid	Sink Creek-Colorado River, Gunnison River Outlet and Kannah Creek-Gunnison River 5th-level Watersheds ¹	294,547	The CEAA would include all sources of waste generated by the project, would be of sufficient size to include other localized waste sources and would contain local stream transport of potential spills.
LAND RESOURCES			
Range Management	Grazing allotments potentially affected by Project surface-disturbing activities ⁴	74,830	The CEAA contains all surface disturbance and ongoing operations activities associated with the proposed Project.
¹ Fifth order watersheds determined from the USGS National Hydrographic Dataset ² Game management unit boundaries from Colorado Parks and Wildlife GIS datasets ³ Area of southern <i>S. glaucus</i> population from McGlaughlin and Ramp-Neale 2012 genetic study. ⁴ Includes Kannah Creek Common, North Kannah Creek, Davis AMP, and Whitewater Common allotments.			

**Table 4.0-2
Surface Disturbance by Cumulative Effects Analysis Areas (excerpted from Table 4.4-1 of the Fram Whitewater EA)**

Facility Type and Cumulative Effects Analysis Area (CEAA)	Count or Miles	Facility Dist. (acres) or ROW (ft.)	Total Dist. (acres)	Count or Miles	Facility Dist. (acres) or ROW (ft.)	Total Dist. (acres)	Total Project Dist. (acres)	Total Cumulative Dist. (acres) (% of CEAA)
	Past and Present Activities			Reasonably Foreseeable Activities				
Affected 5th-order Watersheds (294,547 acres)	18,179			174			0.92	18,354 (6%)
Industry – Total	2,822			172				
Oil & Gas Wells, Access, & Facilities	24	2.3	55	18	1.3	101		
Mining	78	Variable	2,554	0	Variable	0		
Pipelines	21.3	10	26	33.2	Variable	71		
Electric Power Lines	153.9	10	187	0	10	0		
Roads – Total	2,440			2				
Highways	62.7	60	456	0	60	0		
County Roads	111.2	40	539	0.5	40	2		
Local Roads	397.2	30	1,444	0	30	0		
Other – Total	12,918			0				
Hazardous Fuels Reduction	53	Variable	12,842	0	Variable	0		
Canals and Ditches	34.9	18	76	0	18	0		
CPW GMU 41 (209,983 acres)	17,016			181				
Industry – Total	2,496			181				
Oil & Gas Wells, Access, & Facilities	32	2.3	74	25	1.3	110		
Mining	35	Variable	2,267	0	Variable	0		
Pipelines	29.0	10	35	33.2	Variable	71		
Electric Power Lines	99.4	10	120	0	10	0		
Roads – Total	1,180			0				
Highways	51.0	60	371	0	60	0		
County Roads	54.0	40	262	0	40	0		
Local Roads	150.4	30	547	0	30	0		
Other – Total	13,340			0				
Hazardous Fuels Reduction	61	Variable	13,281	0	Variable	0		
Canals and Ditches	27.1	18	59	0	18	0		

Facility Type and Cumulative Effects Analysis Area (CEAA)	Count or Miles	Facility Dist. (acres) or ROW (ft.)	Total Dist. (acres)	Count or Miles	Facility Dist. (acres) or ROW (ft.)	Total Dist. (acres)	Total Project Dist. (acres)	Total Cumulative Dist. (acres) (% of CEAA)
	Past and Present Activities			Reasonably Foreseeable Activities				
Southern <i>S. glaucus</i> Population Habitat (259,152 acres)			7,259			183	0.92	7,443 (3%)
Industry – Total			2,820			181		
Oil & Gas Wells, Access, & Facilities	21	2.3	48	25	1.3	110		
Mining	75	Variable	2,587	0	Variable	0		
Pipelines	21.2	10	26	33.2	Variable	71		
Electric Power Lines	130.7	10	158	0	10	0		
Roads – Total			2,948			2		
Highways	77.7	60	565	0	60	0		
County Roads	129.7	40	629	0.5	40	2		
Local Roads	482.5	30	1,755	0	30	0		
Other – Total			1,491			0		
Hazardous Fuels Reduction	10	Variable	1,426	0	Variable	0		
Canals and Ditches	29.6	18	65	0	18	0		
Mesa County (2,140,818 acres)			9,598			0	0.92	9,599 (0.5%)
Roads – Total			9,598			0		
Highways	263.3	60	1,915	NA	60	0		
County Roads	456.8	40	2,215	NA	40	0		
Local Roads	1,503.8	30	5,468	NA	30	0		
Affected BLM Grazing Allotments (74,830 acres)			1,425			161	0.92	1,587 (2%)
Industry – Total			297			161		
Oil & Gas Wells, Access, & Facilities	8	2.3	18	16	1.3	90		
Mining	11	Variable	203	0	Variable	0		
Pipelines	14.5	10	18	33.2	Variable	71		
Electric Power Lines	47.5	10	58	0	10	0		
Roads – Total			159			0		
Highways	8.3	60	60	0	60	0		
County Roads	9.0	40	44	0	40	0		
Local Roads	15.0	30	55	0	30	0		
Other – Total			970			0		
Hazardous Fuels Reduction	9	Variable	917	0	Variable	0		
Canals and Ditches	24.1	18	53	0	18	0		

Air Quality

Increased emissions would occur as a result of construction and operation of the Project. As stated in the Fram Whitewater EA, the predicted PM₁₀ and PM_{2.5} impacts from field-wide Project sources combined with regional source emissions are minimal. When maximum modeled concentrations are added to representative background concentrations, it is demonstrated that the total ambient air concentrations are well below the applicable NAAQS and CAAQS. In addition, direct modeled concentrations are below the applicable PSD Class II increments. The direct modeled cumulative concentrations of NO₂, SO₂, PM₁₀, and PM_{2.5} at Class I and sensitive Class II areas were compared to applicable PSD Class I and Class II increments and are well below the PSD Class I and Class II increments.

Soils

The CEAA for soil resources is taken as the fifth-order watersheds affected by Project disturbance (see Table 4.0-1), an area comprising approximately 294,547 acres. Past and present surface disturbance from analyzed activities within the CEAA is approximately 18,179 acres. Additional surface disturbance resulting from analyzed foreseeable activities is estimated to be approximately 174 acres. When added to the proposed Project disturbance, the total cumulative surface disturbance is estimated to be 18,354 or 6 percent of the CEAA (see Table 4.0-2).

Other past, present and foreseeable developments and uses in the Project Area with impacts to soils include but are not limited to natural gas development, grazing fences, access roads, highways, trails, pipelines, wildland fires, vegetation treatments and right-of-way facilities. Some of these actions, such as fires and vegetation treatments, have resulted in short-term increases in sedimentation and erosion but long-term reductions in these impacts. Other impacts such as those associated with roads and long-term facilities have increased impacts to soils. Under the Proposed Action, which would include reclamation, cumulative effects to soils would be similar to historic levels if the protective/mitigation measures described in Chapter 3 are implemented.

Water

The CEAA for water resources is taken as the fifth-order watersheds affected by Project disturbance (see Table 4.0-1), an area comprising approximately 294,547 acres. Past and present surface disturbance from analyzed activities within the CEAA is approximately 18,179 acres. Additional surface disturbance resulting from analyzed foreseeable activities is estimated to be approximately 174 acres. When added to the proposed Project disturbance, the total cumulative surface disturbance is estimated to be 18,354 or 6 percent of the CEAA (see Table 4.0-2). As outlined in the environmental consequences portion of the document, increased surface disturbance may elevate sediment production from the Project Area. However, protective/mitigation measures would mitigate long-term measurable impacts to water resources within or downstream of the Project Area. Likewise, no cumulative impacts to groundwater quality or quantity are anticipated given the geologic setting and successful implementation of the protective/mitigation measures.

Other past, present and foreseeable developments and uses in the Project Area with impacts to water quality include but are not limited to natural gas development, grazing fences, access roads, highways, trails, pipelines, wildland fires, vegetation treatments and right-of-way facilities. Some of these actions, such as fires and vegetation treatments, have resulted in short-term increases in sedimentation and erosion but long-term reductions in these impacts. Other impacts such as those associated with roads and long-term facilities have increased impacts to water quality. Under the Proposed Action, which would include BMPs for sedimentation and

reclamation, cumulative effects to water quality would be similar to historic levels if the protective/mitigation measures described in Chapter 3 are implemented.

Noise

Most of the area including the Proposed Action has noise levels consistent with sound at outdoor rural residential locations. The single consistent producer of anthropogenic noise is traffic on U.S. Highway 50.

Within the affected 5th-field watersheds there are 571 miles of highways, county, and local roads. With existing levels of vehicular traffic, natural resource development, and ranching activities in the area, average noise increases are expected to be related to individual vehicles, and, therefore, cumulative effects from noise would be minimal.

Vegetation and Invasive, Non-native Species

The CEAA for vegetation and invasive, non-native species is taken as the fifth-order watersheds affected by Project disturbance (see Table 4.0-1), an area comprising approximately 294,547 acres. Past and present surface disturbance from analyzed activities within the CEAA is approximately 18,179 acres. Additional surface disturbance resulting from analyzed foreseeable activities is estimated to be approximately 174 acres. When added to the proposed Project disturbance, the total cumulative surface disturbance is estimated to be 18,354 or 6 percent of the CEAA (see Table 4.0-2).

Other past, present, and foreseeable developments and uses in the Project Area which can affect vegetation and/or increase and/or spread invasive, non-native species include but are not limited to natural gas development, grazing fences, access roads, highways, trails, pipelines, wildland fires, vegetation treatments, and right-of-way facilities. Some of these actions, such as fires and vegetation treatments, have resulted in short-term increases in sedimentation and erosion but long-term reductions in these impacts. Other impacts such as those associated with roads and long-term facilities have increased impacts to vegetation. Under the Proposed Action, which would include reclamation, cumulative effects to vegetation would be similar to historic levels if the protective/mitigation measures described in Chapter 3 are implemented.

Special Status Species (Animal and Plant Species)

Animal Species. The CEAA for special status animal species is taken as the fifth-order watersheds affected by Project disturbance (see Table 4.0-1), an area comprising approximately 294,547 acres. Past and present surface disturbance from analyzed activities within the CEAA is approximately 18,179 acres. Additional surface disturbance resulting from analyzed foreseeable activities is estimated to be approximately 174 acres. When added to the proposed Project disturbance, the total cumulative surface disturbance is estimated to be 18,354 or 6 percent of the CEAA (see Table 4.0-2).

Other past, present, and foreseeable developments and uses in the Project Area with impacts to special status animal species include but are not limited to natural gas development, grazing fences, access roads, highways, trails, pipelines, wildland fires, vegetation treatments and right-of-way facilities. Under the Proposed Action, which would include reclamation, cumulative effects to special status animal species would be similar to or better than historic levels if the protective/mitigation measures described in Chapter 3 are implemented.

In terms of reasonably foreseeable actions, it should be noted that special status species are generally protected and/or avoided for any activities on public land but may not be protected for actions on private land.

Plant Species. The CEAA for threatened or endangered plant species is taken as the habitat of the southern population of *Sclerocactus glaucus* (see Table 4.0-1), an area comprising approximately 259,152 acres. Past and present surface disturbance from analyzed activities within the CEAA is approximately 7,259 acres. Additional surface disturbance resulting from analyzed foreseeable activities is estimated to be approximately 183 acres. When added to the proposed Project disturbance, the total cumulative surface disturbance is estimated to be 7,443 or 3 percent of the CEAA (see Table 4.0-2).

Other past, present, and foreseeable developments and uses in the Project Area with impacts to special status plant species include but are not limited to natural gas development, grazing fences, access roads, highways, trails, pipelines, wildland fires, vegetation treatments and right-of-way facilities. Some of these actions, such as fires and vegetation treatments, have resulted in short-term increases in sedimentation and erosion but long-term reductions in these impacts. Other impacts such as those associated with roads and long-term facilities have increased impacts. Under the Proposed Action, which would include reclamation, cumulative effects to special status plant species would be similar to or better than historic levels if the protective/mitigation measures described in Chapter 3 are implemented.

Wildlife

The CEAA for wildlife is taken as CPW Game Management Unit 41 (see Table 4.0-1), an area comprising approximately 209,983 acres. Past and present surface disturbance from analyzed activities within the CEAA is approximately 17,016 acres. Additional surface disturbance resulting from analyzed foreseeable activities is estimated to be approximately 181 acres. When added to the proposed Project disturbance, the total cumulative surface disturbance is estimated to be 17,198 or 8 percent of the CEAA (see Table 4.0-2).

Cumulative effects to wildlife would be directly related to habitat loss, habitat fragmentation, animal displacement, and direct mortalities. Following completion of the Project, the reclaimed areas would be capable of supporting wildlife use. Cumulative impacts from past and present actions and reasonably actions within the CEAA could include:

Reduction of suitable habitat/habitat fragmentation. While surface disturbance generally corresponds to associated wildlife habitat loss, accurate calculations of cumulative wildlife habitat loss cannot be determined because the direct impacts of habitat disturbance are species-specific and dependent upon: 1) the status and condition of the population(s) or individual animals being affected; 2) seasonal timing of the disturbances; 3) value or quality of functional habitat the disturbed sites; 4) physical parameters of the affected and nearby habitats (e.g., extent of topographical relief and vegetative cover); 5) value or quality of functional habitats in adjacent areas; 6) the type of surface disturbance; and 7) other variables that are difficult to quantify (e.g., increased noise and human presence). Historic, current, and future developments in the CEAA have resulted, or would result, in the reduction of carrying capacities as characterized by the amount of available cover, forage, and breeding areas for wildlife species. Current or previous surface disturbance in the CEAA primarily results from natural gas development, grazing fences, access roads, highways, trails, pipelines, wildland fires, vegetation treatments and right-of-way facilities.

Animal displacement. Displaced individuals of any species could be forced into less suitable habitats, possibly resulting in subsequent effects of deteriorated physical condition, reproductive

failure, mortality, and general stress as important habitat is reduced and animals are subjected to density-dependent effects. Loss of habitat/forage consequently could result in increased competition between and among species for available resources, increased transmission and susceptibility to disease, increased predation opportunities, and emigration. Some wildlife species, such as raptors, would be susceptible to these cumulative impacts since encroaching human activities in the CEAA have resulted, or would result, in animal displacement in areas that may currently be at their relative carrying capacity for these resident species. Many of the local wildlife populations (e.g., small game, migratory birds) that occur in the CEAA likely would continue to occupy their respective ranges and breed successfully, although population numbers may decrease relative to the amount of cumulative habitat loss and disturbance from incremental development.

Decreased reproduction success. A decrease in reproductive success and physical condition from increased energy expenditure due to physical responses to disturbance could lead to declining population growth.

Increased vehicle/wildlife collisions. An increase in traffic levels on roadways has the potential to increase vehicle/wildlife collisions and increased human utilization of resources through hunting and other recreational activities that would expose wildlife to potential human harassment, either inadvertent or purposeful.

Increased hunting pressure. An increase in human activity in the CEAA may provide the opportunity for additional hunting pressure on game species such as mule deer, pronghorn, and small game species due primarily to increased public access.

Increased illegal harvest. An increase in human activity in the CEAA may lead to poaching game species due to increased public presence and public access.

Under the Proposed Action, which would include reclamation, cumulative effects to wildlife would be similar to or better than historic levels if the protective/mitigation measures described in Chapter 3 are implemented.

Transportation and Access

The CEAA for transportation and access is taken as the area of Mesa County (see Table 4.0-1), an area comprising approximately 2,140,818 acres. Analysis of this resource is limited to existing and foreseeable road development. Past and present road development within the CEAA is approximately 9,598 acres (see Table 4.0-2). There is currently no foreseeable road disturbance (not including short industry access roads or existing road upgrades, which have been analyzed as part of oil and gas well disturbance). Under the Proposed Action, cumulative effects to transportation and access would be minimal if the protective/mitigation measures described in Chapter 3 are implemented.

Wastes, Hazardous or Solid

The CEAA for hazardous or solid wastes is taken as the fifth-order watersheds affected by Project disturbance (see Table 4.0-1), an area comprising approximately 294,547 acres. Past and present surface disturbance from analyzed activities within the CEAA is approximately 18,179 acres. Additional surface disturbance resulting from analyzed foreseeable activities is estimated to be approximately 174 acres. When added to the proposed Project disturbance, the total cumulative surface disturbance is estimated to be 18,354 or 6 percent of the CEAA (see Table 4.0-2). Under the Proposed Action cumulative effects from wastes would be prevented or minimal if the protective/mitigation measures described in Chapter 3 are implemented.

Range Management

The CEAA for range management is taken as the BLM grazing allotments affected by Project disturbance (see Table 4.0-1), an area comprising approximately 74,830 acres. Past and present surface disturbance from analyzed activities within the CEAA is approximately 1,425 acres. Additional surface disturbance resulting from analyzed foreseeable activities is estimated to be approximately 161 acres. When added to the proposed Project disturbance, the total cumulative surface disturbance is estimated to be 1,587 or 2 percent of the CEAA (see Table 4.0-2).

Other past, present, and foreseeable developments and uses in the Project Area with impacts to range resources include but are not limited to natural gas development, grazing fences, access roads, highways, trails, pipelines, wildland fires, vegetation treatments and right-of-way facilities. Some of these actions, such as fires and vegetation treatments, have resulted in short-term increases in sedimentation and erosion but long-term reductions in these impacts. Other impacts such as those associated with roads and long-term facilities have increased impacts. Under the Proposed Action, which would include reclamation, cumulative effects to range resources would be similar to historic levels if the protective/mitigation measures described in Chapter 3 are implemented.

CHAPTER 5 - CONSULTATION AND COORDINATION

5.1 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONTACTED

The BLM has consulted the following individuals, organizations and agencies:

- U.S Fish and Wildlife Service
- Colorado Department of Wildlife
- Colorado State Historic Preservation Office
- Southern Ute Indian Tribe
- Ute Mountain Ute Tribe
- Ute Indian Tribe of the Uintah and Ouray Reservation

5.2 INTERDISCIPLINARY REVIEW

Edge Environmental, Inc., an environmental consulting firm, prepared this document under the direction and independent evaluation of the BLM. The BLM, in accordance with 40 CFR 1506.5 (a) and (c), is in agreement with the findings of the analysis and approves and takes responsibility for the scope and content of this document.

INTERDISCIPLINARY REVIEW

NAME	TITLE	AREA OF RESPONSIBILITY
Natalie Fast Alissa Leavitt-Reynolds	Archaeologist	Cultural Resources, Native American Religious Concerns, National Historic Trails
Andy Windsor	Outdoor Recreation Planner	Access, Transportation, Recreation, VRM
Jacob Martin	Range Management Specialist	Vegetation, Forestry, Range Management
David Scott Gerwe	Geologist	Minerals, Paleontology
Alan Kraus	Hazard Materials Specialist	Hazardous Materials
Robin Lacy	Realty Specialist	Land Tenure/Status, Reality Authorizations
Heidi Plank	Wildlife Biologists	T&E Animal Species, Migratory Bird Treaty Act, Terrestrial & Aquatic Wildlife
Anna Lincoln	Ecologist	Land Health Assessment, Special Status Plant Species
Ed Rumbold	Hydrologist/Soil Water Air Lead	Soils, Water Quality, Hydrology, Water Rights
Lathan Johnson	Fire Ecologist Natural Resource Specialist	Fire Ecology, Fuels Management
Mark Taber	Weed and Range Management Specialist	Invasive, Non-Native Species (Weeds)
Christina Stark	NEPA and Environmental Coordinator	Environmental Justice, Prime & Unique Farmlands, Environmental Coordinator, Socioeconomics, and Riparian

Edge Environmental, Inc.

Resource/Responsibility	Contact
Mary Bloomstran	Project Manager
Carolyn Last	Document Control, Cumulative analysis
Jim Zapert (Carter Lake Consulting)	Air Quality and Climate
Nikie Gagnon	Water Resources, Land Tenure, ROW, Other Uses, Soils
Rebecca Buseck	Invasive, Non-Native Species, Vegetation, Wetlands and Riparian Zones, Special Status Plants, Migratory Birds, Wildlife (Fish, Aquatic and Terrestrial), Special Status Animal Species, Range Management, Fire and Fuels, Wastes, Hazardous or Solid
Josh Moro	Cultural Resources, Paleontological Resources, Tribal
Sandra Goodman	Socioeconomics, Environmental Justice, Transportation/Access
Joseph Thomas	GIS Analysis

CHAPTER 6 - REFERENCES

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