

4 CUMULATIVE IMPACTS AND IRREVERSIBLE/IRRETRIEVABLE COMMITMENT OF RESOURCES

4.1 Introduction

CEQ regulations for the NEPA define cumulative impact as follows:

"...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

As required under the NEPA and the regulations implementing the NEPA, this chapter addresses those cumulative effects on the environmental resources in the CESAs, which could result from the implementation of the Proposed Action and reasonable alternatives, past actions, present actions, and reasonably foreseeable future actions (RFFAs). The extent of the CESA will vary with each resource, based on the geographical or biological limits of that resource. As a result, the list of projects considered under the cumulative analysis vary according to the resource being considered. In addition, the length of time for cumulative effects analysis will vary according to the duration of impacts from the Proposed Action on the particular resource.

For the purposes of this analysis and under federal regulations, ‘impacts’ and ‘effects’ are assumed to have the same meaning and are interchangeable. The cumulative impacts analysis was accomplished through the following three steps:

- Step 1: Identify, describe, and map CESAs for each resource to be evaluated in this chapter;
- Step 2: Define timeframes, scenarios, and acreage estimates for cumulative impact analysis. Past and present disturbances and activities include commercial/public and mining operations with disturbed areas not reclaimed or unsatisfactorily reclaimed (based on a pre-bonding timeframe) (impacts from those activities are reflected in the current condition). Future scenarios address reasonably foreseeable actions from the following: grazing and agriculture; utilities and infrastructure activities; wildfires, fuels management and reseeding activities; wild horse gathers; other wild horse management activities; habitat stabilization and rehabilitation activities; noxious weed and invasive, nonnative species control activities; recreation and wilderness activities; land development activities; mining and exploration operations identified in notices and plans of operation; hazardous/solid waste and hazardous materials activities; or oil and gas operations; and
- Step 3: Identify and quantify (if possible) the location of possible specific impacts from the Proposed Action and judge the significance of these contributions to the overall impacts. The incremental impact of the Proposed Action is determined by first calculating the sum of all the past, present, and RFFAs (excluding the Proposed Action) actions and then determining incremental increase from the Proposed Action (e.g., if all actions, excluding the Proposed Action, total 1,000 acres and the Proposed Action is ten acres, then the incremental contribution of the Proposed Action would be one percent).

Information utilized in the cumulative impacts assessment was gathered from the following sources: the BLM; State of Nevada; local jurisdictions; private land owners; and mining companies. The past actions, present actions, and RFFAs are current as of February 2011. Changes in actions after this date are not considered in this analysis.

Environmental consequences of the Proposed Action and the reasonable alternatives were evaluated in Chapter 3 for the various environmental resources. Based upon the analysis of the environmental resources as completed in Chapter 3, the following resources could be impacted by the Proposed Action and reasonable alternatives: water quality and quantity; geology and minerals; air quality; soils; vegetation; wildlife and fisheries; special status species; livestock grazing and production; land use authorizations; recreation and wilderness; visual resources; auditory resources; socioeconomics; hazardous materials; cultural resources; forest products; historic trails; Native American Traditional Values; noxious weeds, invasive, nonnative species; transportation and access; wetlands and riparian zones; migratory birds; and wild horses. The above resources are considered to have the potential to be cumulatively impacted by actions within the identified CESA for that resource.

4.2 Cumulative Effects Study Areas

The geographical areas considered for the analysis of cumulative effects are generally illustrated in Figures 4.2.1 and 4.2.2. The locations vary in size and shape to reflect each evaluated environmental resource. Table 4.2-1 outlines the CESAs and their size, as well as references to the figures that show the area.

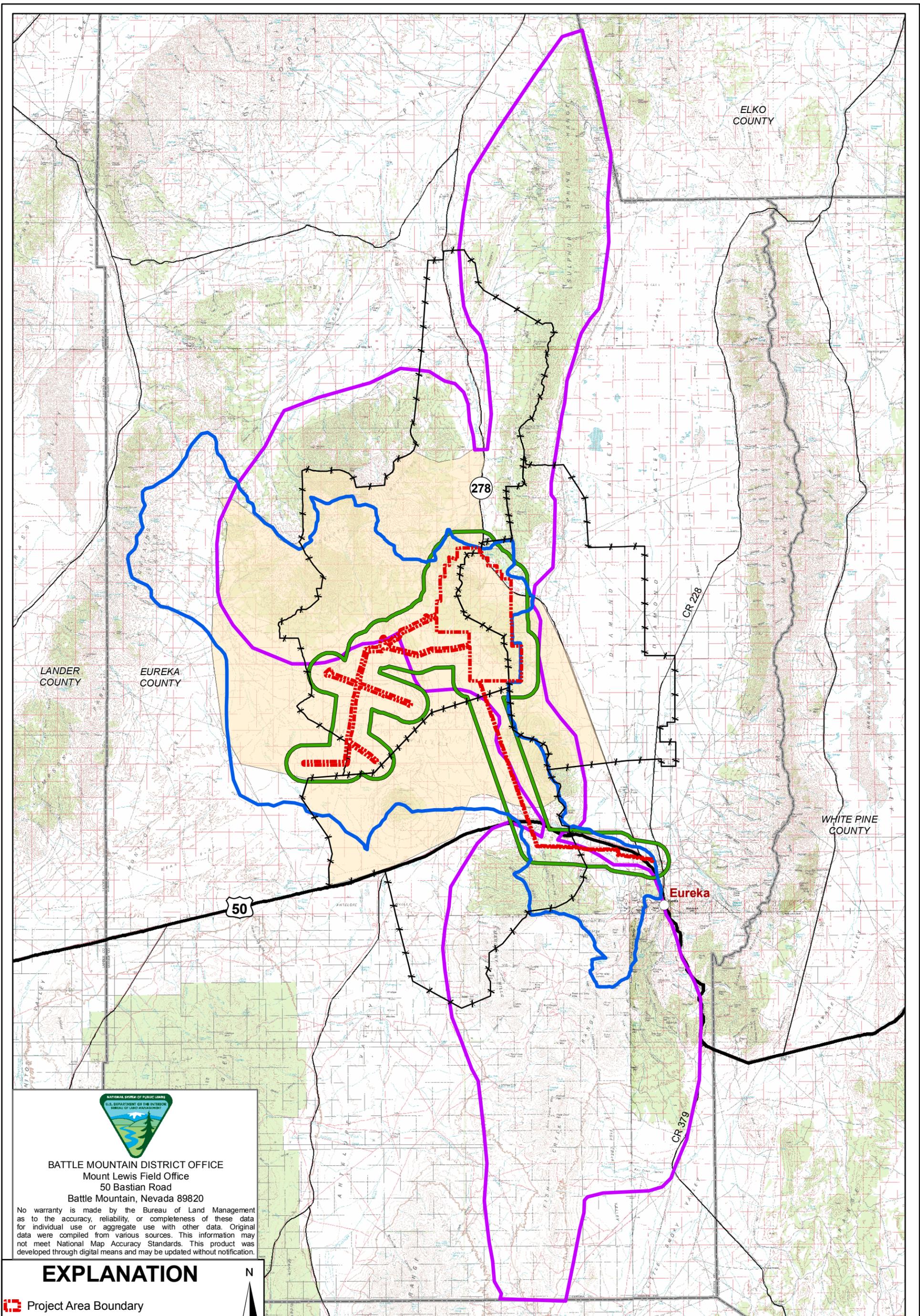
The CESA for surface water and ground water quality and quantity was determined to be the three hydrographic subbasins, based on the location of the Project relative to the location and patterns of subsurface waters and aquifers.

The CESA for geology and minerals was determined to be an area 30 miles in radius from the Project's open pit, based on a determination that the area adequately encompassed the resource use in the east central portion of Nevada.

The CESA for air quality was determined to be the three air basins within which the Project is located, based on the anticipated extent of air impacts. The regulatory framework for air resources in the State of Nevada is based on air basins.

The CESA for soils, vegetation (including special status plant species and fire management), noxious weeds, invasive nonnative species, and wetlands and riparian zones was determined to be the local watershed, based on an assessment that each of these resources would have similar impact characteristics within the local watershed for the Project Area.

The CESA for wildlife and fisheries (including special status animal species and migratory birds) was determined to be the four hunt units, since any potential effect to wildlife from the Project would be to wildlife that utilize the four hunt units.



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EXPLANATION

-  Project Area Boundary
-  Immediate Watershed CESA
-  Land Use and Access CESA
-  Livestock Grazing and Production CESA
-  Wild Horse CESA
-  Forestry CESA



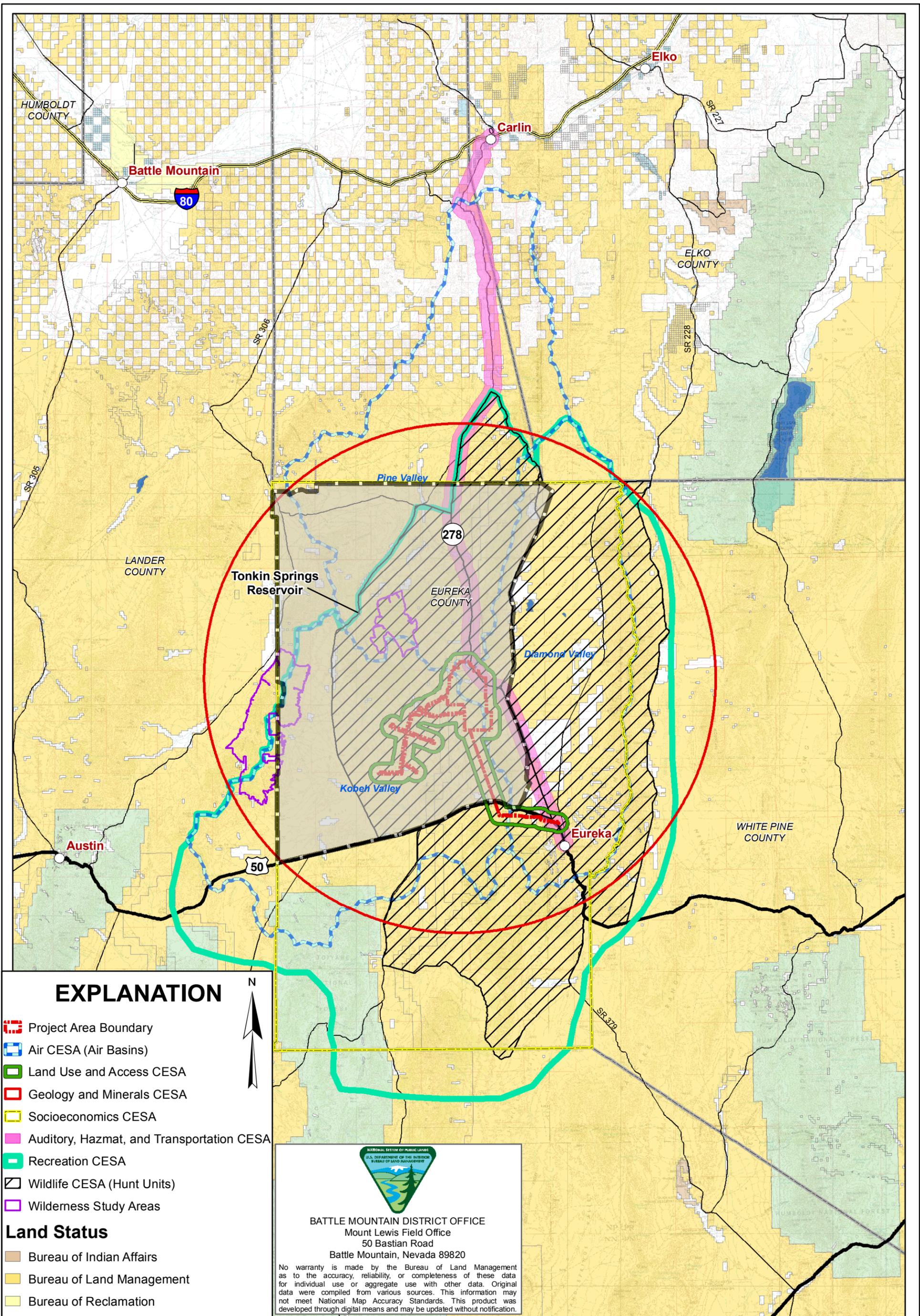
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BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT

DRAWING TITLE:

**Large Scale Cumulative
 Effects Study Areas Map**

Figure 4.2.1



EXPLANATION

- Project Area Boundary
- Air CESA (Air Basins)
- Land Use and Access CESA
- Geology and Minerals CESA
- Socioeconomics CESA
- Auditory, Hazmat, and Transportation CESA
- Recreation CESA
- Wildlife CESA (Hunt Units)
- Wilderness Study Areas

Land Status

- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- U. S. Forest Service
- U. S. Fish and Wildlife Service
- State of Nevada
- Private
- Water



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Small Scale Cumulative Effects Study Areas Map

Figure 4.2.2

The CESA for livestock grazing and production was determined to be the grazing allotments that the Project is located within, as well as the allotments in the ten-foot drawdown contour associated with the ground water impacts (Section 3.2.3), based on the fact that the allotments define the range resource.

The CESA for land use was determined to be the area within a one-mile buffer around the Project, based on an assessment that any effect of the Project to land use authorization and access would not extend beyond a one-mile buffer of the Project Area.

Table 4.2-1: Cumulative Effects Study Areas by Resource

RESOURCE	CUMULATIVE EFFECTS STUDY AREA	SIZE OF AREA (acres)	Figure Number Reference
Ground Water Quality and Quantity	Hydrographic Subbasins 53, 139, 153	1,671,181	4.2.2 4.4.1
Surface Water Quality and Quantity	Hydrographic Subbasins 53, 139, 153	1,671,181	4.2.2 4.4.1
Geology and Minerals	Thirty-mile radius around the open pit	1,809,552	4.2.2 4.3.4
Air Quality	Hydrographic Subbasins 53, 139, 153	1,671,181	4.2.2
Soils	Immediate Watershed	262,490	4.2.1
Vegetation (including Special Status Species and Fire Management)	Immediate Watershed	262,490	4.2.1
Wildlife and Fisheries (including Special Status Species)	NDOW Hunt Units 142, 143, 144, and 145	1,250,319	4.2.2
Livestock Grazing and Production	Grazing Allotments	378,328	4.2.1
Land Use	One mile buffer around the Project Area	75,901	4.2.1
Recreation and Wilderness	An area generally bounded by the Simpson Park Range, Pine Valley, Newark Valley and approximately 30 miles south of the Town of Eureka	1,970,179	4.2.2
Visual Resources	Viewshed of the Project as represented by the KOPs	Approx. 645,000	3.7.1
Auditory Resources	One mile buffer around the Project Area, the SR 278 transportation corridor (including the City of Carlin), and U.S. Highway 50 from SR 278 through the Town of Eureka	97,720	4.2.1
Socioeconomics	Southern Eureka County	1,692,208	3.17.1
Hazardous Materials	One-mile buffer around the Project Area, the SR 278 transportation corridor (including the City of Carlin), and U.S. Highway 50 from SR 278 through the Town of Eureka	97,720	4.2.2
Cultural Resources	Project Area, and the viewshed of the Project from specific historic cultural properties within 20 miles of the Project	200,960	3.7.1
Historic Trails	Viewshed of the Project from the Pony Express Trail	69,061	3.20.1

RESOURCE	CUMULATIVE EFFECTS STUDY AREA	SIZE OF AREA (acres)	Figure Number Reference
Native American Traditional Values	North Central Nevada from Kobeh Valley to the Tuscarora Mountains, and from the Shoshone Range to the Piñon Range	3,218,045	4.4.2 4.3.3
Environmental Justice	Southern Eureka County	1,692,208	3.17.1
Noxious Weeds, Invasive and Nonnative Species	Immediate Watershed	262,490	4.2.1
Wetlands and Riparian Zones	Immediate Watershed	262,490	4.2.1
Wild Horses	Roberts Mountain, Whistler Mountain, and Fish Creek (north of U.S. Highway 50) HMAs and historic use areas.	253,610	4.2.1
Transportation and Access	One-mile buffer around the Project Area, the SR 278 transportation corridor (including the City of Carlin), and U.S. Highway 50 from SR 278 through the Town of Eureka	97,720	4.2.2
Forestry Products	The Sulphur Springs Ranges, the Roberts Mountains, the Whistler Mountains, and the Fish Creek Range within Eureka County.	515,000	4.2.1

The CESA for recreation and wilderness is based on the anticipated Project-related increase in population and demands on recreation and wilderness resources from the expected population increase as opposed to potential specific effects associated with the mining activities. For this reason, the CESA has been defined by topography and the inclusion of areas typically utilized by the residents of Eureka and Diamond Valley. The recreation and wilderness CESA includes the area east of the Simpson Park crest, south of the JD Ranch Road/northern end of Diamond Valley Playa, west of the middle or eastern edge of Newark Valley, and north of a boundary located approximately 30 miles south of Eureka (an area that would include the Fish Creek Range, Mahogany Hills, Ninemile Peak portion of the Antelope Range, and the northern portion of the Monitor Range).

The CESA for visual resources was determined to be the viewshed of the Project as represented by the KOPs, based on the fact that it is the area where the Project effects could be viewed relative to cumulative activities. The viewshed contains approximately 645,000 acres.

The CESA for auditory, hazardous materials, and transportation and access was determined to be the area within a one-mile radius around the Project, the SR 278 transportation route (including the City of Carlin, and U.S. Highway 50 from SR 278 through the Town of Eureka), based on the assessment that any effect to the Project from hazardous materials would not extend beyond a one-mile buffer of the Project Area or on SR 278 and U.S. Highway 50.

The CESA for socioeconomic and environmental justice was determined to be southern Eureka County, based on the assumption that the socioeconomic effects of the Project would be focused in southern Eureka County.

The CESA for cultural resources was determined to be the Project Area and the viewshed of the Project from selected historic cultural properties, based on the fact that the Project could only directly affect cultural resources within the Project Area, and any indirect effects would only be

visual from those specific historic cultural properties where the Project's effects could be viewed relative to cumulative activities.

The CESA for historic trails was determined to be the viewshed of the Project from the Pony Express Trail, based on the fact that it is the area where Project effects could be viewed relative to cumulative activities.

The CESA for Native American Traditional Values was determined to be the area of north central Nevada, which encompasses Kobeh Valley on the south, the Tuscarora Mountains on the north, the Shoshone Range on the west, and the Piñon Range on the east, based on information obtained through Native American consultation for the Proposed Action, the Cortez Hills Expansion Project, and other actions in the Mount Lewis and Tuscarora Field Offices.

The CESA for wild horses was determined to be the HMAs that the Project is located within, as well as the adjacent historic use areas.

The CESA for forestry products was determined to be the area that encompasses the Sulphur Springs Range, the Roberts Mountains, the Whistler Mountains, and the Fish Creek Range within Eureka County.

The cumulative impacts analysis for this EIS utilizes a time frame based on the estimated potential future duration of the impacts from the Proposed Action. Based on a Project approval in 2011 and a 32-year mining life and a 44-year milling operations life, the time frames over which the cumulative analysis was completed are as follows:

- Geology and minerals and cultural resources - length of the mining portion of the Project; approximately 32 years (through 2043);
- Water resources and wetlands and riparian zones - time frame for the maximum extent of drawdown, which would occur after processing is completed is greater than 200 years in the future (beyond 2200); and
- Air quality, visual resources, soils, vegetation resources, noxious weeds, invasive and nonnative species, livestock grazing and production, wild horses, recreation and wilderness, auditory resources, social and economic values, wildlife and fisheries, hazardous materials, transportation and access, historic trails, Native American Traditional Values, environmental justice, forestry products, and land use - length of the Project, including reclamation; approximately 74 years (through 2085).

The types of Project-specific impacts to the resources evaluated in Chapter 3 may also occur as a result of the past actions, other present actions, and RFFAs. The potential cumulative effects from the past actions, present actions, and RFFAs are discussed in Section 4.4. The individual projects described in Section 4.3 comprise the past and present actions, and RFFAs identified by the BLM's MLFO, Tuscarora, and Egan Field Offices.

The projects and activities include the following: grazing and agriculture; utilities and distribution; wildfires and reseeded; fuels management projects; stabilization and rehabilitation activities; noxious weed and invasive, nonnative species control activities; recreation; land

development; mineral development and exploration; and oil, gas, and geothermal leasing. All of the projects and activities have the potential to impact the environmental resources of concern within all or portions of the various CESAs.

Table 4.2-2 outlines all the actions considered in the cumulative impacts analysis, their status, potential environmental impacts, and the area of the potential impact. An explanation of the abbreviations and numbering is located at the end of the table. In addition to the actions outlined in Table 4.2-2, there are a number of activities or management actions that have or would affect vegetation or vegetation health, which have occurred in the past, are occurring now, and will continue to occur in the future. These include timber removal for historic mining activities, livestock use and management, wildlife use, and wild horse use and management. The BLM is also in the process of revising their RMP for the BMDO, which includes the Project and surrounding areas. The BLM is currently in the early stages of the RMP development and no specific activities or alternatives have been developed. The development of the revised RMP may result in changes to management decisions and directions on public lands.

Table 4.2-2: Summary of Activities that May Cumulatively Affect Resources

PROJECT DESCRIPTIONS	STATUS	ANTICIPATED RESOURCES THAT COULD BE CUMULATIVELY IMPACTED	PRIMARY/ SECONDARY IMPACT LOCATION
Grazing, Agriculture, and Forest Product Activities			
Open Range Operations	PP, RF	1, 4, 5, 6, 7, 8, 13, 15, 20, 21, 23	AW, WL
Fenced Feeding Operations	PP, RF	1, 4, 5, 6, 7, 8, 13, 15, 20, 21,23	AW, WL
Range Improvements (fences, cattle guards, wells, windmills, pipeline/trough, springs, water pumps, noxious weed control)	PP, RF	1, 4, 5, 6, 7, 8, 13, 15, 20, 21	AW, WL
Irrigated Crops	PP, RF	1, 4, 6, 7, 8, 13, 15, 20, 21,23	AW, WL
Personal Fire Wood and Christmas Tree Harvesting	PP, RF	3, 4, 5, 6, 12, 13, 17, 20, 21,23	NA, WL
Commercial Fire Wood Harvesting	PP, RF	3, 4, 5, 6, 12, 13, 17, 20, 21,23	NA, WL
Commercial Pine Nut Harvesting	PP, RF	3, 4, 5, 6, 12, 13, 17, 20, 21,23	NA, WL
Public (including Native American) Pine Nut and Woodland Products Harvesting	PP, RF	3, 4, 5, 6, 12, 13, 15, 20, 21,23	NA, WL
Greenwood Cutting	PP, RF	3, 4, 5, 6, 12, 13, 17, 20, 21,23	NA, WL
Utilities and Infrastructure			
Powerlines	PP, RF	1, 4, 5, 6, 7, 8, 9, 11, 15, 16, 20, 21, 23	AW
Telephone	PP, RF	1, 4, 5, 6, 7, 8, 9, 11, 15, 16, 20, 21, 23	AW
Communication Sites	PP,RF	1, 4, 5, 6, 7, 8, 9, 11, 15, 16, 20, 21, 23	AW
Paved Roads	PP, RF	1, 3, 4, 5, 6, 7, 8, 9, 11, 15, 16, 20, 21, 23	AW
Unpaved Roads	PP, RF	1, 3, 4, 5, 6, 7, 8, 9, 11, 15, 16, 20, 21, 23	AW
Railroads	PP, RF	1, 3, 4, 5, 6, 7, 8, 9, 11, 15, 16, 20, 21, 23	AW
Public Water Facilities	PP	1, 7, 13, 23	AW
Wind Generation	RF	1, 4, 5, 6, 7, 8, 9, 10, 11, 13, 15, 20, 21, 23	WL
Other Federal Facilities	PP, RF	1, 4, 5, 6, 7, 8, 9, 11, 15, 16, 20, 21, 23	AW
Reservoirs	PP	1, 6, 7, 8, 10, 21, 23	RC, WL
Wildland Fires, Fuels Management, and Reseeding			
Henderson-Romano Project Fuels Treatment	RF	1, 3, 4, 5, 6, 7, 8, 10, 11, 15, 20, 21, 23	WL, AW

PROJECT DESCRIPTIONS	STATUS	ANTICIPATED RESOURCES THAT COULD BE CUMULATIVELY IMPACTED	PRIMARY/ SECONDARY IMPACT LOCATION
Henderson Creek Project Fuels Treatment	RF	1, 3, 4, 5, 6, 7, 8, 10, 11, 15, 20, 21, 23	WL, AW
Sulphur Springs Fuels Treatment	RF	1, 3, 4, 5, 6, 7, 8, 10, 11, 15, 20, 21, 23	WL, AW
Mahogany Hills-Spring Valley Fuels Treatment	RF	1, 3, 4, 5, 6, 7, 8, 10, 11, 15, 20, 21, 23	WL, AW
Fenstermaker Wash Project Fuels Treatment	RF	1, 3, 4, 5, 6, 7, 8, 10, 11, 15, 20, 21, 23	WL, AW
Northwest Diamond Valley Fuels Reduction	PP	1, 3, 4, 5, 6, 7, 8, 10, 11, 20, 21, 23	WL, AW
Tonkin Project Fuels Treatment	PP	1, 3, 4, 5, 6, 7, 8, 10, 11, 20, 21, 23	WL, AW
Red Hills Fuels Reduction	PP	1, 3, 4, 5, 6, 7, 8, 10, 11, 20, 21, 23	WL, AW
Seven Mile Fuels Reduction	PP	1, 3, 4, 5, 6, 7, 8, 10, 11, 20, 21, 23	WL, AW
Eureka-South Diamond Valley Fuels Reduction	PP	1, 3, 4, 5, 6, 7, 8, 10, 11, 20, 21, 23	WL, AW
Wildland Fires	PP, RF	1, 3, 4, 5, 6, 7, 8, 10, 11, 20, 21, 23	WL, AW
Habitat Stabilization, Rehabilitation, and Wild Horse Management Activities			
3-Bars Ecosystem and Landscape Restoration Project	RF	1, 5, 6, 7, 8, 21	AW, WL
Trout Creek Restoration	PP	1, 5, 6, 7, 8, 21	WL
Pine Creek Restoration	PP	1, 5, 6, 7, 8, 21	WL
Willow Creek Canyon	PP	1, 5, 6, 7, 8, 21	WL
Noxious Weed Control Activities	PP, RF	5, 6, 7, 20	WL, IM
Roberts Mountain Allotment Enclosure	PP	1, 5, 6, 7, 8, 21	WL
3-Bars East Range Enclosures	PP	1, 5, 6, 7, 8, 21	WL
Roberts Mountain WSA Road Rehabilitation	PP	5, 6, 7, 8, 10, 20, 21	WL
Allotment Management for Habitat	PP, RF	5, 6, 7, 8, 21	WL, IW
Wild Horse Management	PP, RF	1, 5, 6, 7, 8, 15, 21, 23	AW, IW
Federal Water Facilities	PP, RF	1, 5, 6, 7, 8, 15, 21, 23	AW, IW
Recreation and Wilderness			
Annual Pony Express Trail Re-Rides	PP, RF	6, 10	RC
Yearly Permits for Commercial Outfitters and Guides	PP, RF	6, 10, 13	RC
Land Speed Record Attempt on Diamond Valley Playa	RF	6, 10	RC
Dispersed Recreation	PP, RF	6, 10, 15	RC
Recreation Use Areas (Roberts Mountain WSA, Simpson Park WSA, Tonkin Springs, Roberts Mountains, Antelope Range, Simpson Park Range)	PP, RF	6, 10	RC
Hickison Petroglyph Recreation Site	PP, RF	6, 10, 15	RC
Land Development			
Eureka	PP, RF	1, 3, 4, 5, 6, 7, 9, 13, 19	AW, WL
Diamond Valley	PP, RF	1, 3, 4, 5, 6, 7, 9, 13, 19	AW, WL
Kobeh Valley	RF	1, 3, 4, 5, 6, 7, 9, 13, 19	AW, WL
Pine Valley	RF	1, 3, 4, 5, 6, 7, 9, 13, 19	AW, WL
Land Sales	PP, RF	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21	WL, AW

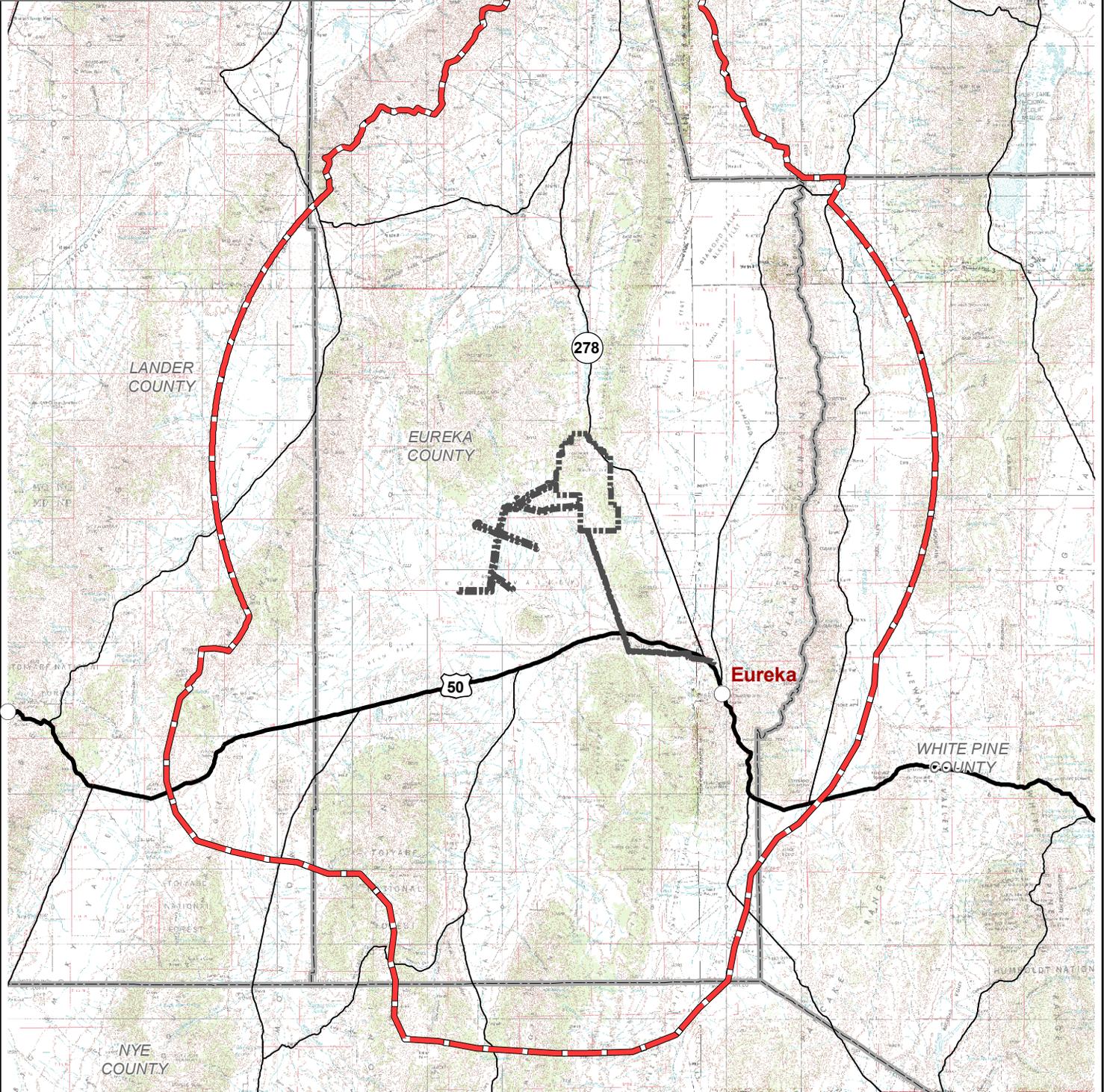
PROJECT DESCRIPTIONS	STATUS	ANTICIPATED RESOURCES THAT COULD BE CUMULATIVELY IMPACTED	PRIMARY/ SECONDARY IMPACT LOCATION
Mineral Development and Exploration			
Mining and Exploration Plans of Operations (30)	PP, RF	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 28, 19, 20, 21	AW
Exploration Notices (164)	PP, RF	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 28, 19, 20, 21	AW
Sand and Gravel Extraction Operations (35)	PP, RF	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 28, 19, 20, 21	AW
Historic Eureka Mining District	PP	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 28, 19, 20, 21	AW
Hazardous/Solid Waste and Hazardous Materials			
Mine Hazardous/Solid Waste	PP	14	PT
Mine Hazardous Materials	PP	14	PT
Landfills	PP, RF	6, 9, 15, 21	AW, WL
Oil, Gas, and Geothermal Leasing			
Oil and Gas Leases (583)	PP	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 28, 19, 20, 21	AW, MG
Oil and Gas Development (five)	PP, RF	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 28, 19, 20, 21	AW, MG
See key on next page.			
Source of Information: BLM-BM: BLM BMDO BLM-EK: BLM Elko Office BLM-EL: BLM Ely Office EML: Eureka Moly LLC NDOW: Nevada Department of Wildlife NDEP: Nevada Division of Environmental Protection NDOT: Nevada Department of Transportation	Status: PP-Past and Present Actions RF-Reasonably Foreseeable	Issues: 1-Water Resources 2-Geology and Minerals 3-Air Quality 4-Soils 5-Vegetation 6-Wildlife and Fisheries 7-Wetlands and Riparian Zones 8-Livestock Grazing and Production 9-Land Use 10-Recreation and Wilderness 11-Visual Resources 12-Auditory Resources 13-Social and Economic Values 14-Hazardous Materials 15-Cultural Resources 16-Historic Trails 17-Native American Traditional Values 18-Paleontology 19-Environmental Justice 20-Noxious Weeds, Invasive and Nonnative Species 21-Wild Horses 22-Transportation and Access 23-Forest Products	Location: AW-Air and Water Basins GA-Grazing Allotments HA-Herd Area IW-Immediate Watershed LU-Land Use and Access MG-Minerals and Geology NA-Native American PA-Project Area PT-Project Area and Transportation RC-Recreation SE-Social and Economic WL-Wildlife and Special Status Species

Figure 4.2.3 illustrates the cumulative projects data collection area. Table 4.2-3 outlines the acres of surface disturbance associated with each of the actions considered in the cumulative impact area of analysis illustrated in Figure 4.2.3. The acreage values in Table 4.2-3 are totals under each category. Project-specific acres within each resource CESA are discussed under that resource. Table 4.2-4 outlines the activities and disturbance associated with the Native American Traditional Concerns CESA.



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EXPLANATION

- Project Area Boundary
- Cumulative Projects Data Collection Area



0 5 10 15 Miles

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DRAWING TITLE:
Cumulative Projects Data Collection Area (except Native American)
Figure 4.2.3

Table 4.2-3: Surface Disturbance¹ Associated with Projects within the Cumulative Effects Study Areas

PROJECT DESCRIPTIONS	PAST AND PRESENT (ACRES)	RFFA (ACRES)	TOTAL (ACRES)
Grazing, Agriculture, and Forest Product Activities			
Open Range Operations	nq	nq	nq
Fenced Feeding Operations	nq	nq	nq
Range Improvements (fences, cattle guards, wells, windmills, pipeline/trough, springs, water pumps, noxious weed control)	nq	nq	nq
Irrigation Facilities	156	0	156
Irrigated Crops	28,580	760	29,340
Personal Fire Wood and Christmas Tree Harvesting	nq	nq	nq
Commercial Fire Wood Harvesting	nq	nq	Nq
Commercial Pine Nut Harvesting	nq	nq	nq
Public (including Native American Traditional Values) Pine Nut and Woodland Product Harvesting	nq	nq	nq
Green Wood Cutting	nq	nq	nq
Subtotal	28,736	760	29,496
Utilities and Infrastructure			
Powerlines	9,115	413	9,528
Telephone	4,930	34	4,964
Communication Site	231	1	232
Paved Roads	12,315	nq	12,315
Unpaved Roads	1,818	nq	1,818
Railroads	380	0	380
Public Water Facilities	489	0	489
Wind Generation	21,233	0	21,233
Other Federal Facilities	804	0	804
Reservoirs	60	0	60
Subtotal	51,375	448	51,823
Wildland Fires, Fuels Management, and Reseeding			
Henderson-Romano Project Fuels Treatment	0	23,200	23,200
Henderson Creek Project Fuels Treatment	0	1,000	1,000
Sulphur Springs Fuels Treatment	0	4,200	4,200
Mahogany Hills-Spring Valley Fuels Treatment	0	21,500	21,500
Fenstermaker Wash Project Fuels Treatment	0	35,500	35,500
Northwest Diamond Valley Fuels Reduction	1,349	0	1,349
Tonkin Project Fuels Treatment	350	0	350
Red Hills Fuels Reduction	1,000	500	1,500
Seven Mile Fuels Reduction	40,984	0	40,984
Eureka-South Diamond Valley Fuels Reduction	2,087	0	2,087
Wildland Fires	247,500	0	247,500
Subtotal	283,270	85,900	369,170

PROJECT DESCRIPTIONS	PAST AND PRESENT (ACRES)	RFFA (ACRES)	TOTAL (ACRES)
Habitat Stabilization, Rehabilitation, and Wild Horse Management Activities			
3-Bars Ecosystem and Landscape Restoration Project ²	nq	nq	nq
Trout Creek Restoration	nq	nq	nq
Pine Creek Restoration	nq	nq	nq
Willow Creek Canyon	2,000	0	2,000
Noxious Weed Control Activities	306	0	21
Roberts Mountain Allotment Exclosure	48	0	48
3-Bars East Range Exclosure	nq	0	0
Roberts Mountain WSA Road Rehabilitation	5	0	5
Allotment Management for Habitat	867	44,094	44,961
Federal Water Facilities	22	0	22
Subtotal	3,248	44,094	47,057
Recreation and Wilderness			
Annual Pony Express Trail Re-Rides	nq	nq	nq
Yearly Permits for Commercial Outfitters and Guides	nq	nq	nq
Land Speed Record Attempt on Diamond Valley Playa	nq	nq	nq
Dispersed Recreation	nq	nq	nq
Recreation Use Areas (Roberts Mountain WSA, Simpson Park WSA, Tonkin Springs, Roberts Mountains, Antelope Range, Simpson Park Range)	nq	nq	nq
Hickison Petroglyph Recreation Site	5	0	5
Subtotal	5	0	5
Land Development			
Eureka	880	0	880
Diamond Valley	700	0	700
Kobeh Valley	0	280	280
Pine Valley	0	480	480
Land Sales	0	5,000	5,000
Other	8,637	97	8,734
Subtotal	10,217	5,857	16,074
Mineral Development and Exploration			
Mining and Exploration Plans of Operations (30)	13,301	1,113	14,414
Exploration Notices (164)	368	24	392
Sand and Gravel Extraction Operations (35)	565	10	575
Historic Eureka Mining District (estimated)	200	0	200
Subtotal	14,434	1,147	15,581
Hazardous/Solid Waste and Hazardous Materials			
Mine Hazardous/Solid Waste	0	0	0
Mine Hazardous Materials	0	0	0
Landfills	40	80	120
Subtotal	40	80	120

PROJECT DESCRIPTIONS	PAST AND PRESENT (ACRES)	RFFA (ACRES)	TOTAL (ACRES)
Oil, Gas, and Geothermal Leasing			
Oil and Gas Leases (583)	0	573	573
Oil and Gas Development (five)	283	0	283
Subtotal	283	573	856
Total	391,608	138,859	530,467

nq - not quantified.

1 - Surface disturbance includes the actual disturbance of the ground or the removal of vegetation.

2 - This project encompasses an area that is approximately 750,000 acres. Currently an EIS is being prepared for the project. At this time no activities have officially been determined.

Table 4.2-4: Past, Present, and Reasonably Foreseeable Future Actions for the Native American Traditional Concerns Cumulative Effects Study Area¹

Action	Past and Present Approved Disturbance (acres)	RFFA Projected Disturbance (acres)	Total Approved/ Projected Disturbance (acres)	Dewatering / Ground Water Consumption		Located in Piñon-Juniper or Piñon Communities ²	
				Yes	No	Yes	No
Atlas Gold Bar	1,320	0	1,320		X	X	
Black Rock Canyon Mine	117	0	117		X		X
Bootstrap Project	1,505	0	1,505		X		X
Buckhorn Mine	820	0	820		X	X	
Carlin Mine	1,385	0	1,385		X		X
Clipper Mine	400	0	400		X		X
Cortez Mine	1,662	0	1,662		X		X
Gold Acres	881	50	931		X		X
Hilltop Mine	92	0	92		X		X
Horse Canyon	698	0	698		X	X	
Pipeline Project	7,616	0	7,616	X			X
Cortez Hills	6,792	0	6,792	X		X	
Robertson Mine	285	0	285		X		X
Cortez Silver Mining District	92	0	92		X	X	
EML Mount Hope	8,318	0	8,318	X		X	
Elder Creek Mine	143	0	143		X		
South Operations Area Project	5,750	0	5,750	X			X
Goldstrike/Betze Project	4,379	0	4,379	X			X
Greystone Mine	242	0	242		X	X	
Ivanhoe Project/Hollister Project	342	0	342	X			X
Leeville Project	486	0	486	X			X
Meikle Mine	92	0	92	X			X
Arturo/Storm Project	124	8,148	8272	X			X
Mule Canyon Mine	2,931	0	2,931	X			X
Rain/Emigrant Project	383	0	383	X			X

Action	Past and Present Approved Disturbance (acres)	RFFA Projected Disturbance (acres)	Total Approved/ Projected Disturbance (acres)	Dewatering / Ground Water Consumption		Located in Piñon-Juniper or Piñon Communities ²	
				Yes	No	Yes	No
Subtotal	38,055	8,198	40,931	--	--	--	--
BLM Fuels Reduction Projects ³	5,641	0	5,641		X	X	X
Wildland Fires ⁴	622,311	0	622,311		X	X	X
Agriculture Development ⁵	9,750	0	9,750	X			X
Carlin Water Supply	2	0	2	X			X
Eureka Water Supply	2	0	2	X			X
Crescent Valley Water Supply	2	0	2	X			X
Subtotal	637,708	0	637,708	--	--	--	--
Total	683,278	8,198	692,108	--	--	--	--

¹ This table is based on data and information taken directly from the Cortez Hills Expansion Project FEIS (BLM 2008b) and modified to include the Cortez Hills Expansion Project and the Mount Hope Project.

² P-J and P Communities are Piñon-Juniper and Piñon Vegetation Communities, as defined in the GAP data set.

³ Inclusive of acreage associated with the Crescent Valley Wildland Urban Interface Fire Defense System, Tonkin Hazardous Fuels Reduction Project, and Red Hills Hazardous Fuels Reduction Project. Of the total acreage, planned prescribed burns would affect up to 2,537 acres of piñon-juniper woodland, and 800 acres of piñon-juniper would be thinned.

⁴ Reflects acreage of vegetation affected by wildland fires from 1998 through 2006. The acreage is inclusive of approximately 27,804 acres of fire affected piñon-juniper woodland.

⁵ Surface disturbance associated with agricultural development is based on the acreage under irrigation and assumes that a change in vegetation and habitat equates to surface disturbance. Acreage values were based on a February 15, 1998, special hydrographic abstract for Hydrographic Basin No. 054 from the NDWR. These values are based on permitted or authorized use of water and may not reflect actual use in a given year. Potential agricultural development outside of Crescent Valley has not been quantified.

Source: BLM 2008b.

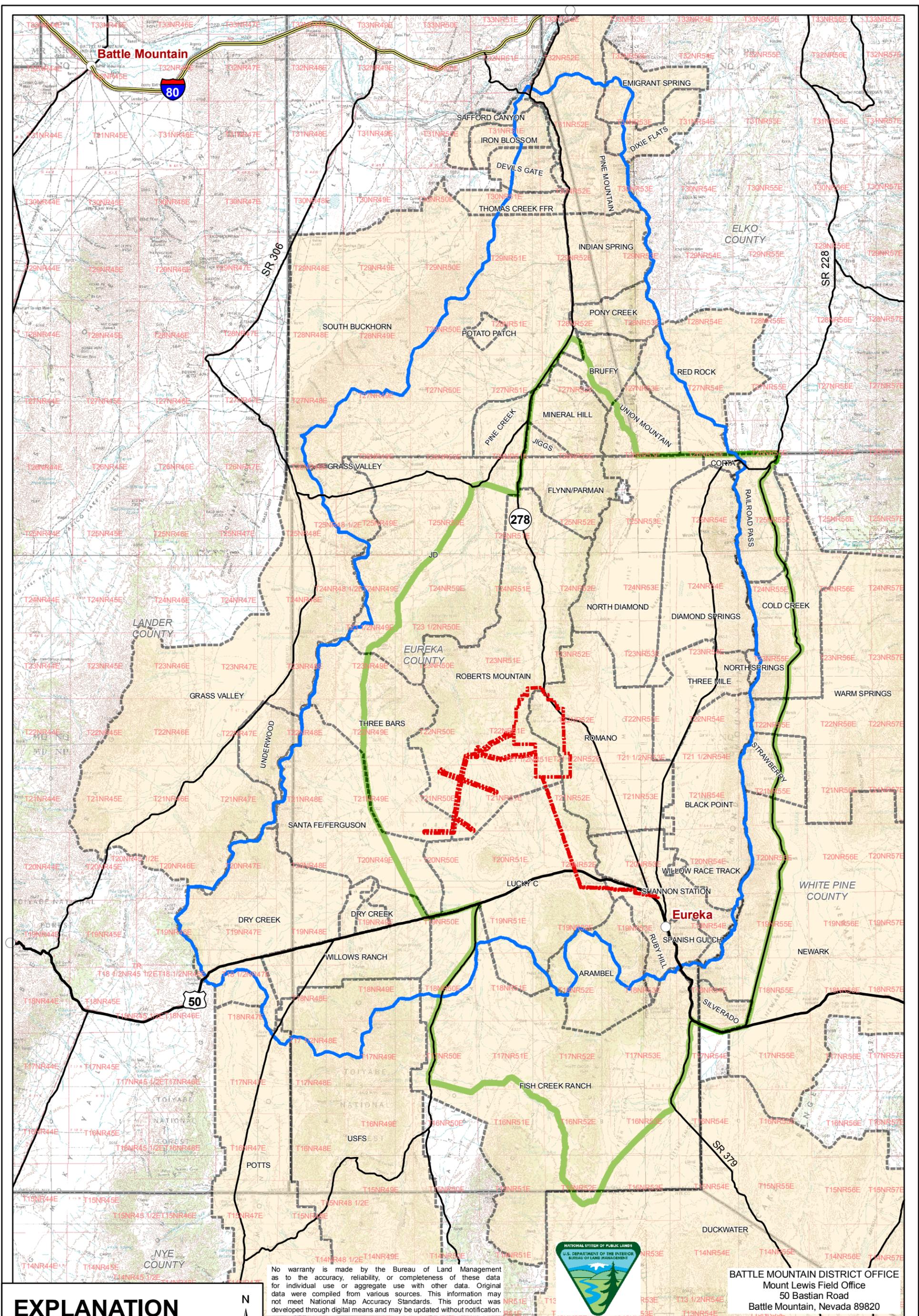
4.3 Past, Present, and Reasonably Foreseeable Future Actions

4.3.1 Grazing, Agriculture, and Forest Products

4.3.1.1 Past and Present Actions

Livestock grazing has been and continues to be a dominant land use in Eureka County and the adjoining portions of Elko, Lander, White Pine, and Nye Counties. Multiple grazing allotments have been permitted and administered by the BLM over approximately the past half century. Portions of 49 grazing allotments or federal fenced ranges exist within the area of all the CESAs (Figure 4.3.1). The carrying capacity, which is assumed to be the long-term use by livestock, wild horses, and wildlife, of these 49 grazing allotments is approximately 131, 311 AUMs. The capacity of these allotments has been adjusted over the years in response to mineral development, drought, wildland fires, availability of stock water, and rangeland condition.

Surface water sources that support livestock grazing and agriculture within the CESAs include reservoirs, perennial creeks, springs, and seeps. Improved water sources include developed springs, stock wells, stock ponds, water pipelines, and troughs. Livestock will generally congregate near these features. Cow-calf pairs, heifers, steers, cows, and sheep graze on residual forage in alfalfa fields, irrigated pastures, and rangeland within Eureka County and the adjoining portions of Elko, Lander, White Pine, and Nye Counties. Existing livestock water use includes 613 stock water rights in the three hydrographic basins at a projected total rate of 1,447 afy. In



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EXPLANATION

- Project Area Boundary
- Air Quality CESA
- Grazing Allotments
- Wildlife and Fisheries CESA



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MOUNT HOPE PROJECT

DRAWING TITLE:
Grazing Allotments within Air Quality and Wildlife and Fisheries CESAs Map

Figure 4.3.1

addition, a substantial amount of four-strand (three barbed and one smooth wire on the bottom) wire fencing has been constructed within the CESAs. Surface disturbance and changes to the vegetation community have occurred as a result of past and present livestock use; the actual acreage for this has not been quantified; however, some of these uses are range improvements that include fences, cattleguards, noxious weed control, water troughs, spring improvements, wells, reservoirs, windmills and tanks, and pipelines. Figure 4.3.2 identifies the number of range improvements by township within the CESAs.

Areas under irrigation in Diamond Valley expanded from 3,200 acres in 1961 to 22,200 acres in 1990 (USGS 2006). Existing (active or recently active) agricultural development in Diamond Valley, identified using October 13, 2006, aerial photographs (Google Earth™), appears to remain at approximately 22,200 acres. Water use for irrigation increased from approximately 12,000 afy in 1965 to approximately 64,000 afy in 1990. Current water rights have been identified as of February 2011, using NDWR data, at approximately 134,000 afy from underground sources.

Areas under irrigation in Kobeh Valley were approximately 880 acres in 1990 (USGS 2006). Existing agricultural development in Kobeh Valley, identified as of December 23, 2007, using aerial photographs, appears to be approximately 1,200 acres. Current water rights have been identified as of December 23, 2007, using NDWR data, at approximately 16,000 afy from underground sources.

Existing agricultural development in Pine Valley identified as of December 23, 2007, using aerial photographs, appear to remain at approximately 5,100 acres. Current water rights have been identified as of December 23, 2007, using NDWR data, at approximately 14,500 afy from underground sources.

Commercial pine nut harvesting occurs under permits issued by the BLM MLFO. Figure 4.3.3 shows the areas where this type of harvesting is permitted within the Native American Traditional Concern CESA, which comprises 382,428 acres and includes 167,441 acres of piñon-juniper and piñon only vegetation communities. The most recent highly productive year for commercial harvesting was in 1998 when 50,000 pounds of nuts were harvested and then again in 2004. Between these two years the production of pine nuts was very low. Yearly commercial pine nut harvesting is very sporadic, based on the tree production of cones and nuts. Also shown on this figure are the areas of piñon-juniper and piñon only vegetation communities, which comprise a total of 364,934 acres. Approximately 46 percent of these vegetation communities are subject to commercial harvest

Other forest product harvesting activities include, but are not limited to, the commercial and personal cutting of piñon and juniper for fire wood, the personal cutting of piñon for Christmas trees, the greenwood cutting of primarily juniper for fence posts, and commercial and personal harvesting pine nuts.

4.3.1.2 Reasonably Foreseeable Future Actions

Livestock grazing is expected to continue at management levels established in the various grazing allotments including the vicinity of the Proposed Action. Short-term (typically two to four years) adjustments to livestock numbers are expected in response to wildland fires, which

affect forage levels. The following projects are proposed as part of ongoing livestock management programs at the BLM Mount Lewis, Tuscarora, and Egan Field Offices that would occur in the future, separate from mining-related activities:

- livestock and drift fence construction;
- water development (i.e., springs and wells);
- permanent water haul locations;
- sagebrush thinning;
- seeding;
- pipeline construction;
- vegetation manipulation;
- poisonous plant (i.e., tall larkspur) noxious weed population control;
- fence relocation; and
- reservoir construction.

It is reasonable to expect that future commercial pine nut harvesting would continue to be sporadic, based on the tree's production of cones and nuts. It is reasonable to expect that the BLM would continue to allow for forest product harvesting activities, including the cutting of piñon and juniper for firewood, the cutting of piñon for Christmas trees, as well as greenwood cutting of primarily juniper for fence posts.

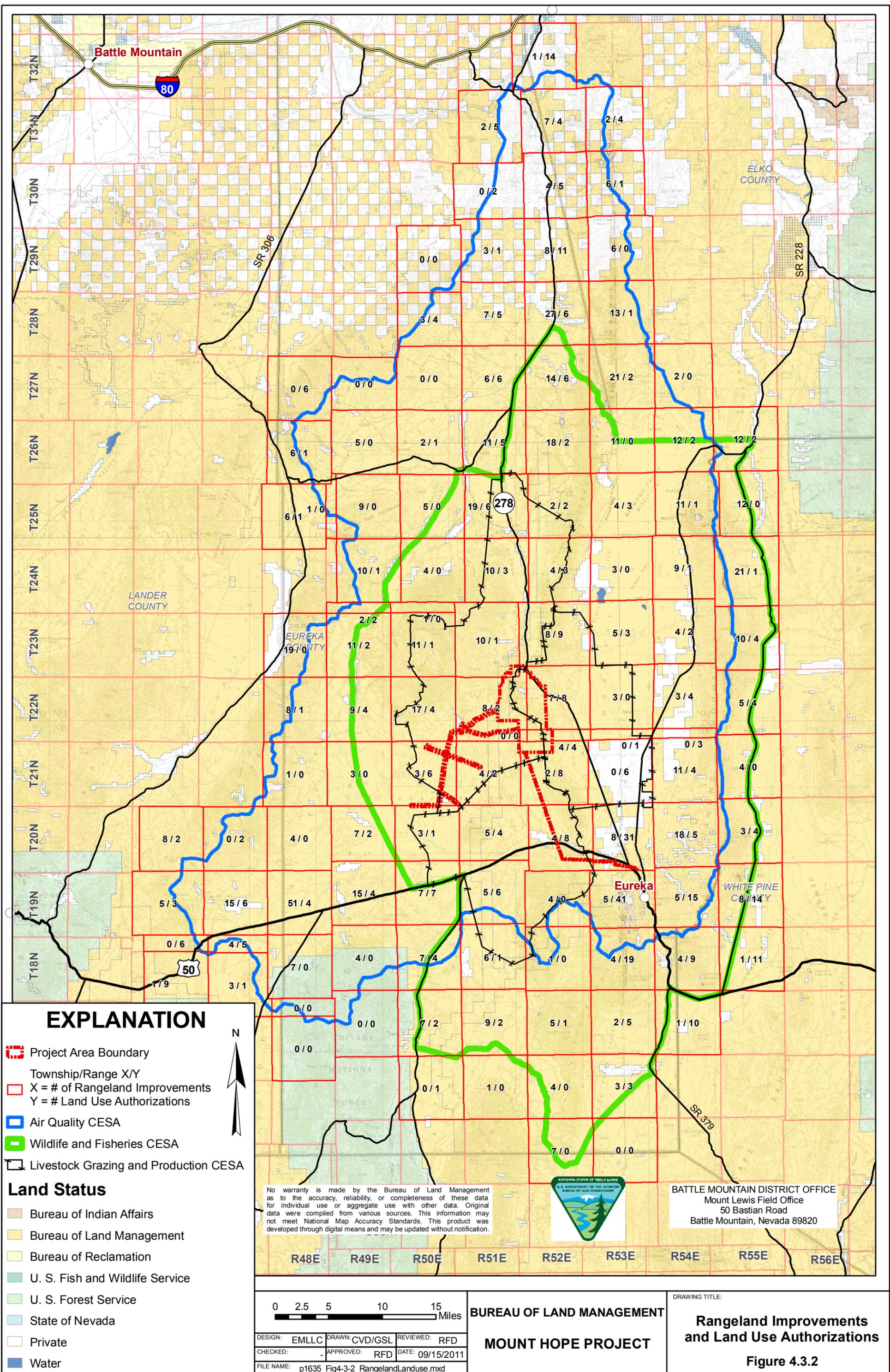
Continued agricultural activities in Diamond Valley, Kobeh Valley, and Pine Valley are reasonably expected to occur in the form of flood and pivot irrigation.

4.3.2 Utilities and Distribution

4.3.2.1 Past and Present Actions

Past utility and distribution actions include the development of roads, powerlines, and telecommunications, as well as public water supply and waste water systems. Roads have been developed by the State of Nevada (U.S. Highway 50, SR 278, and SR 892), Eureka, Lander, White Pine and Elko Counties, the BLM, and the USFS. The Town of Eureka is located in southeastern Eureka County. Individual ranches and farms comprise the remainder of the inhabited areas in southern Eureka County and the surrounding counties of Lander, Nye, White Pine, and Elko.

Three general types of roads have been developed within Eureka County and the adjoining portions of Elko, Lander, White Pine, and Nye Counties: paved roads, gravel surface roads, and dirt roads. Based on aerial photo review available from Google Earth™ and the Eureka County Road Map (Eureka County 2005), there are approximately 254 miles (12,315 acres) of paved roads in the CESAs, including U.S. Highway 50, SR 278, SR 892, and SR 379. In addition, there are approximately 60 miles of paved county roads in the Diamond Valley area. Paved roads in the Town of Eureka have been grouped with the town, which is discussed under Section 4.3.6. Gravel and minor county roads are located throughout Eureka County and the surrounding counties in the CESAs and total approximately 750 miles (1,818 acres). There are an undetermined number of miles of dirt roads on public lands and NFS lands located within the CESAs in Eureka County and the surrounding counties.



EXPLANATION

- Project Area Boundary
- Township/Range X/Y
- X = # of Rangeland Improvements
Y = # Land Use Authorizations
- Air Quality CESA
- Wildlife and Fisheries CESA
- Livestock Grazing and Production CESA

Land Status

- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- U. S. Fish and Wildlife Service
- U. S. Forest Service
- State of Nevada
- Private
- Water



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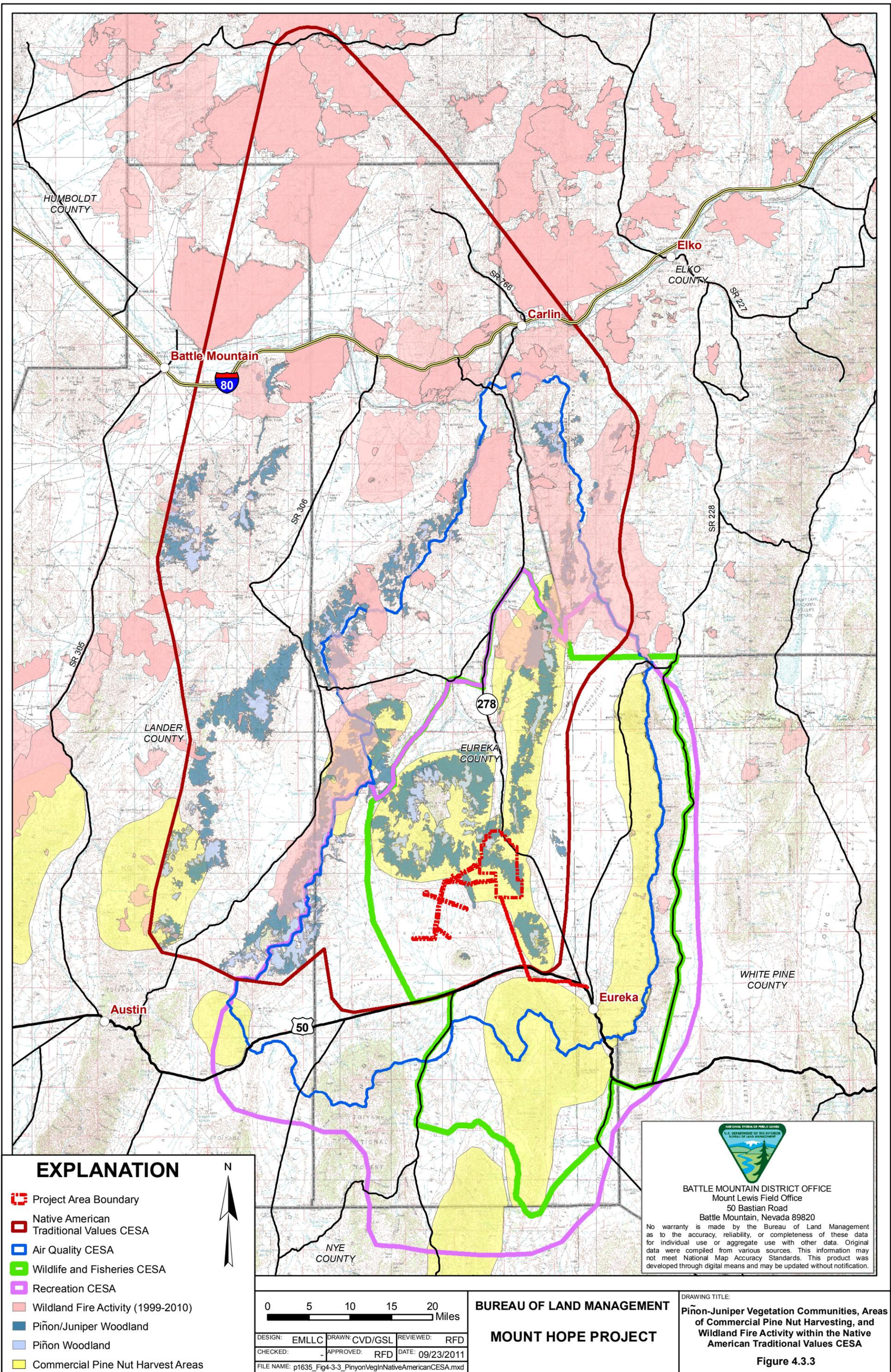
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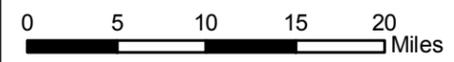
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MOUNT HOPE PROJECT

DRAWING TITLE:
Rangeland Improvements and Land Use Authorizations
Figure 4.3.2



EXPLANATION

- Project Area Boundary
- Native American Traditional Values CESA
- Air Quality CESA
- Wildlife and Fisheries CESA
- Recreation CESA
- Wildland Fire Activity (1999-2010)
- Piñon/Juniper Woodland
- Piñon Woodland
- Commercial Pine Nut Harvest Areas



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MOUNT HOPE PROJECT



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DRAWING TITLE:
Piñon-Juniper Vegetation Communities, Areas of Commercial Pine Nut Harvesting, and Wildland Fire Activity within the Native American Traditional Values CESA
Figure 4.3.3

Two major transmission powerlines are located in Eureka County, distributing power in the State of Nevada as part of the power grid. One is the Falcon-Gondor line that travels from north of Beowawe, Nevada, through the Project Area to U.S. Highway 50 and then east to Ely, Nevada. The other main line is an east-west line that parallels U.S. Highway 50. In addition, there are power distribution lines in Diamond Valley and Eureka. A powerline from Crescent Valley travels south to the Tonkin Springs Mine and then to the southwestern edge of the Roberts Mountains. Based on aerial photo review available from Google Earth™, there are approximately 282 miles (3,418 acres) of transmission lines in the CESAs. In addition, numerous lower voltage distribution lines provide power to two communities, ranches, and commercial activities located throughout Diamond and Kobeh Valleys. These lower voltage lines have not been specifically inventoried.

Within the CESAs, the BLM has issued approximately 375 authorizations for the development of telephone and fiber optic lines, powerlines, communication sites, pipelines, weather stations, global positioning system (GPS) sites, and wells. Figure 4.3.2 identifies the number of authorizations by Township within the CESAs.

The Town of Eureka and the Devil's Gate General Improvement District in Diamond Valley have a community water supply system, which is supplied primarily from ground water wells in Diamond Valley, as well as springs in the Pinto Summit area. There are currently approximately 1,700 afy of water rights that are designated for municipal use. There are small water supply systems at the Ruby Hill Mine and the Devils Gate Area in Diamond Valley, at Tonkin Springs in Pine Valley, and the City of Carlin. All other potable water within the CESAs is provided by individual domestic wells.

There are two major travel routes within the CESAs: U.S. Highway 50 and SR 278. As discussed above, there are a number of county roads within the CESAs. Based on data provided by the NDOT, SR 278 has approximately 580 daily trips within Diamond Valley, and approximately 270 of these trips continue north into Pine Valley and the remainder appear to be confined to Diamond Valley. U.S. Highway 50 appears to have 760 daily trips west of Eureka. Traffic around Eureka on U.S. Highway 50 east of the junction with SR 278 increases to 1,150 daily trips and in Eureka the daily trips increase to 1,950. Traffic on U.S. Highway 50 east of Eureka decreases to 560 daily trips. It is reasonable to assume that there are undocumented daily traffic trips on the county roads that are not represented in the traffic data from the NDOT.

4.3.2.2 Reasonably Foreseeable Future Actions

Development of additional roads is reasonable to anticipate; however, these roads are likely to be dirt roads created by recreational use of the public lands in the CESAs. The Town of Eureka is planning to expand beyond its current limits of development. Need for new transmission lines within this portion of the State of Nevada is not anticipated; however, it is reasonable to expect that additional distribution lines would be constructed.

It is reasonable to expect that traffic would increase in volume on the two major travel routes (U.S. Highway 50 and SR 278) in the CESAs, as well as on the other county roads in proportion to an expected increase in economic activity and population growth.

Wind power generation projects are considered RFFAs. These types of projects could be developed in the Diamond Mountains. Wind power generation projects generally require the installation of a number of wind turbines mounted on towers that range from 100 to 300 feet tall. The turbines are connected to the utility grid with transmission lines that are generally above ground. In addition, a network of roads is necessary for construction and maintenance of the turbines. The land around the turbines is generally fenced to limit public access and use, primarily for safety reasons. An area of up to 640 acres may be fenced.

4.3.3 Wildland Fires, Fuels Management, and Reseeding

4.3.3.1 Past and Present Actions

Wildland fires within the Battle Mountain District burned an average of approximately 5,900 acres per year over the ten-year period from 1988 to 1998, with an average of 33 fires per year. The 1999 fire season far exceeded these averages, with 84 wildland fires burning 274,500 acres. During the 2000 fire season, 71 wildland fires burned 7,440 acres.

There are 15 fire management units (FMUs) located within or overlapping the CESAs, which includes the Battle Mountain District and Elko Districts: Antelope Range; Battle Mountain; Big Smoky; Carico Lake; Charleston; Cortez; Crescent Valley; Diamond Mountains; Eureka/Diamond Valley; Fish Creek Range/Shoshone Mountains; Monitor/Smoky; Reese River/Grass Valley; Roberts; 3 Bars; and Tuscarora. Between 2001 and 2008, 79 wildland fires within the 15 FMUs burned 402,418 acres within the CESAs (Figure 4.3.3). A majority of the wildland fires were caused by lightning and are located in the northern portion of the Native American Traditional Values CESA. In addition, a few wildland fires occurred in the northern portion of the Water and Air CESAs, and the western margin of the Native American Traditional Values CESA. A total of 3,289 acres were seeded within the 2006 and 2007 burned areas in the CESAs within the MLFO.

In addition to the wildland fires, there have been a number of vegetation treatments or fuels reduction projects in the CESAs. These projects include the Red Hills Hazardous Fuels Reduction Project, the Tonkin Hazardous Fuels Reduction Project, the Seven Mile Hazardous Fuels Reduction Project (Phase I and II), the Eureka-South Diamond Wildland Urban Interface/Fire Defense Systems Project, and the North Diamond Allotment Vegetation Treatment.

The Red Hills project area encompasses 3,671 acres. When complete, this project will have resulted in broadcast prescribed fire on a total of 1,700 to 2,537 acres (46 to 70 percent of the Red Hills project area), up to 100 acres treated by pile or slash burning, and up to 400 acres treated utilizing mechanical methods.

The Decision Record for the Sulphur Springs Project was signed on September 17, 2009. This project will be implemented in phases and will not treat more than 2,000 acres per year over the life of the project. The project will treat 500 to 1,000 acres of piñon-juniper and sagebrush vegetation with prescribed fire in a mosaic pattern, and treat 6,000 to 7,000 acres of piñon-juniper and sagebrush vegetation with mechanical methods (i.e., chainsaw, mastication, mowing, chipping) to create fuel breaks.

The Tonkin project encompasses 2,400 acres in the Tonkin Springs area at the northeast end of the Simpson Park Mountains. Approximately 200 acres of sagebrush habitat have been treated by mowing to create fuel breaks using a rotary mower towed by a tractor or a bull-hog. An additional 800 acres of piñon-juniper area have been thinned using chainsaws, a bull-hog, or a feller/buncher. The activity fuels generated by thinning the piñon-juniper were made available for firewood and fence posts. Any activity fuels that were not disposed of in this manner were either chipped or disposed of through pile burning. The footprint for pile burning did not exceed 200 acres.

The Seven Mile project is located approximately 30 miles southwest of Eureka, Nevada, on public lands administered by the MLFO and NFS lands administered by the USFS. The first phase of the project implemented various fuels management methods and techniques to create a series of fuel breaks. Up to approximately 3,323 acres were treated within the project area. The fuel breaks range in size from 131 acres to 570 acres. The second phase of the project is ongoing and consists of prescribed burning a maximum of 2,000 acres of BLM-administered land and 10,000 acres of NFS land annually. In addition, the BLM is also conducting nonfire preparatory treatment on 100 to 500 acres annually. Over the duration of the project, a maximum of approximately 18,794 acres will be treated on the BLM-administered lands and up to approximately 22,190 acres will be treated on the NFS lands for a maximum total of approximately 40,984 acres.

The Eureka-South Diamond Valley project is ongoing with up to 2,087 acres within the 7,400-acre project area to be treated utilizing various methods which include the following: high intensity low frequency grazing; green stripping (chipping or cutting and removing fuels); and mechanized or manual fuels removal using a feller/buncher or chainsaw.

The Northwest Diamond Valley project consists of five areas that measure 1,200 acres each. Treatments include reseeding burned areas, thinning, mowing, and reseeding sagebrush utilizing mechanical and chemical methods. The treatment area totals 6,000 acres for this project.

Approximately 2,000 acres of piñon-juniper were treated in the Willow and Vinini Creek drainages and the Henderson Summit area by the Bootstraps crew in 2008 and 2009 (BLM 2007). Under the Sulphur Springs Hazardous Fuels Reduction Project up to 3,000 acres of piñon-juniper will be removed or thinned and approximately 1,000 acres of greenwood will be cut at a rate of approximately 100 acres per year (BLM 2009).

4.3.3.2 Reasonably Foreseeable Future Actions

Fire suppression and treatments would continue to be an important component of land management within the CESAs as wildland fires are expected to continue. Wildland fires are expected to occur within the 15 FMUs and are likely to include areas previously burned and seeded. RFFAs also include additional fuels treatment projects, which have been proposed as outlined below.

Henderson-Romano Project:

- Treat 12,700 to 22,200 acres of piñon-juniper-sagebrush vegetation with prescribed fire in a mosaic pattern; and

- Treat up to 1,000 acres of piñon-juniper-sagebrush vegetation with mechanical methods (i.e., chainsaw, mastication, mowing, chipping) to create fuel breaks.

Henderson Creek Project:

- Treat up to 1,000 acres of piñon-juniper-sagebrush vegetation with mechanical methods (i.e., chainsaw, mastication) to create fuel breaks.

Mahogany Hills-Spring Valley:

- Treat 8,400 to 19,500 acres of piñon-juniper-sagebrush vegetation with prescribed fire in a mosaic pattern; and
- Treat up to 2,000 acres of piñon-juniper-sagebrush vegetation with mechanical methods (i.e., chainsaw, mastication, mowing, chipping) to create fuel breaks.

Fenstermaker Wash Project:

- Treat 14,000 to 33,500 acres of piñon-juniper-sagebrush vegetation with prescribed fire in a mosaic pattern; and
- Treat up to 2,000 acres of piñon-juniper-sagebrush vegetation with mechanical methods (i.e., chainsaw, mastication, mowing, chipping) to create fuel breaks.

It is reasonable to expect that future commercial pine nut harvesting would continue to be sporadic based on the trees' production of cones and nuts.

It is reasonable to expect that the BLM and local fire districts would conduct fire suppression activities when wildland fires occur. The scale and scope of those activities would be proportional to the size of the wildland fire and proximity to structures.

4.3.4 Habitat Stabilization, Rehabilitation, and Wild Horse Management Activities

4.3.4.1 Past and Present Actions

Past wildlife management actions have focused on the enumeration of wildlife game species and the management of these species for harvest.

The BLM Tuscarora Field Office has initiated activities to complete stream restoration projects on Trout Creek and Pine Creek.

The Pine Creek restoration project was conducted in 1992 and 1993 and included the reach from the Rand Ranch upstream to the confluence with Trout Creek. Head gates were installed, portions of the stream were fenced, and culverts were installed. The area involved in the restoration project has been recolonized by willows and the area is now stable. The cattle are allowed in the excluded area during the frozen winter months to feed. The cattle are limited in the amount of time spent in the riparian area. Wildland fires burned the riparian area during the 2007 fire season.

The Trout Creek restoration project was conducted in the mid-1980s and included four enclosures in the middle and upper reaches of Trout Creek. Trout Creek supports Lahontan cutthroat trout/rainbow trout hybrids. In 2002, the BLM constructed an additional enclosure along the lower reaches as part of an effort to protect areas seeded following the Bailey Fire. In

2004, the BLM completed fencing segments between the enclosures in an effort to create a riparian pasture. Other habitat restoration activities included the planting of mountain alder (*Alnus* sp.), aspen, and chokecherry along the stream channel in the four enclosures between 1994 and 2000.

The Willow Creek Canyon project would involve the removal of piñon and juniper trees over a 2,000-acre area within the Willow Creek drainage. Most trees that would be cut would be less than 12 feet high and six inches in diameter at breast height. The cut trees would be left where they are felled.

Within the Immediate Watershed CESA there are six areas that total approximately 21 acres of identified weeds that have been chemically treated and are monitored.

The Roberts Mountain Allotment enclosure consists of fencing along a four-mile stretch of Roberts Creek and associated riparian area in the southeast quarter of Section 35, T23N, R50E. The enclosure was constructed in 1990, and maintenance was last completed in 2004.

The 3 Bars East Range Enclosure consists of fencing that was completed in 1967 in Sections 22, 27, and 34, T23N, R49E, and Sections 4 and 9, T22N, R49E.

The Roberts Mountain WSA rehabilitation would involve the reclamation of unauthorized land uses within the WSA. This reclamation would include, but not be limited to, recontouring, scarification, and barricading of incursions and inventoried routes.

BLM wildlife management objectives in the 31 allotments that overlap with the wildlife, special status species, and migratory birds CESA are specifically defined in the Shoshone-Eureka, Egan, and Elko Rangeland Program Summaries (RPSs) and are outlined in Table 4.3-1. Within the wildlife, special status species, and migratory birds CESA, a short-term goal is to improve 867 acres of big game habitat to good condition. An overall objective is to manage rangeland habitats to maintain or enhance greater sage-grouse leks and nesting areas.

Table 4.3-1: Summary of Allotments within the Wildlife, Special Status Species, and Migratory Birds Cumulative Effects Study Areas

Allotment ¹	Field Office	Active Livestock Use (AUMs) ⁴	Wildlife Use (AUMs)	Wildlife Management Objectives
Fish Creek Ranch (I)	ML	4,013	2,441	Utilization of riparian habitat to be improved would not exceed 50 percent of key species ² . In the short term, improve 322 acres of riparian habitat in the allotment to good condition. Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ^{2,3} . In the long term, provide habitat to support 3,199 AUMs of big game use, in conformance with other objectives of the RMP. Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.

Allotment ¹	Field Office	Active Livestock Use (AUMs) ⁴	Wildlife Use (AUMs)	Wildlife Management Objectives
Arambel (C)	ML	1,349	1,400	Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ^{2,3} . In the long term, increase big game habitat to support 1,450 AUMs of big game use, in conformance with other objectives of the RMP. Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.
Ruby Hill (M)	ML	1,286	82	Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ^{2,3} . In the long term, provide habitat to support 85 AUMs of big game use, in conformance with other objectives of the RMP. Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.
Shannon Station (I)	ML	3,167	1,391	Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ² . In the long term, provide habitat to support 1,135 AUMs of big game use, in conformance with other objectives of the RMP. In the long term, within the Diamond Hills Habitat Management Plan (HMP) Area, improve 3,656 acres of terrestrial big game habitat to good, and 199 acres to excellent condition. Manage for upward trends on 4,021 acres ³ . Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.
Silverado	EG	338	0	None
Newark	EG	4,885	1,262	Protect greater sage-grouse breeding complexes by maintaining the big sagebrush sites within two miles of active strutting grounds for mid to late seral stage with a minimum of 30 percent shrub composition by weight. Protect ferruginous hawk nest sites by limiting utilization to 50 percent on winterfat flats within two miles of nest sites. Maintain habitat condition of meadows and riparian areas in good or better condition for mule deer and upland game by not exceeding utilization levels on perennial grasses (55 percent) and shrubs (45 percent) along streams and mesic meadows. Improve 3.5 miles of stream riparian habitat from poor/fair to good or better condition.
Strawberry	EG	1,032	0	None
Warm Springs	EG	7,744	10,284	Improve and maintain habitat condition of meadows and riparian areas from poor to good or better condition for mule deer and upland game. Utilization levels will not exceed 55 percent on perennial grasses and 45 percent on shrubs along stream riparian areas and mesic meadows. Limit utilization of browse species in critical deer winter range to a maximum of 45 percent of current annual growth. Protect greater sage-grouse breeding complexes by maintaining the big sagebrush sites within two miles of active strutting grounds for mid to late seral stage with a minimum of 30 percent shrub composition by weight. Protect ferruginous hawk nest sites by limiting utilization to 50 percent on winterfat flats within two miles of nest sites. Improve three miles of stream riparian habitat condition from poor/fair to good or better (Deadman and Old Deadman Creeks).

Allotment ¹	Field Office	Active Livestock Use (AUMs) ⁴	Wildlife Use (AUMs)	Wildlife Management Objectives
Cold Creek	EG	5,094	832	Maintain habitat condition of meadows and riparian areas from poor to good or better condition for mule deer and upland game by not exceeding utilization levels on perennial grasses (55 percent) and shrubs (45 percent) along stream riparian areas and mesic meadows. Protect greater sage-grouse breeding complexes by maintaining the big sagebrush sites within two miles of active strutting grounds for mid to late seral stage with a minimum of 30 percent shrub composition by weight. Protect ferruginous hawk nest sites by limiting utilization to 50 percent on winterfat flats within two miles of nest sites. Maintain and improve 9.25 miles of stream riparian habitat to good or better condition.
North Springs	ML			Part of Three-Mile in the RPS.
Willow Racetrack (M)	ML	250	0	None.
Railroad Pass	EG	1,364	682	Maintain habitat condition of meadows and riparian areas in good or better condition for mule deer and upland game. Protect greater sage-grouse breeding complexes by maintaining the big sagebrush sites within two miles of active strutting grounds for mid-late seral stage with a minimum of 30 percent shrub composition by weight. Protect ferruginous hawk nest sites by limiting utilization to 50 percent on winterfat flats within two miles of nest sites. Maintain 0.25 mile of stream riparian in good or better condition.
Corta	ML			Managed with the Railroad Pass Allotment.
Diamond Springs (I)	ML	3,179	1,433	Utilization of riparian habitat to be improved would not exceed 50 percent on key species ² . In the short term improve 69 acres within the Diamond Hill HMP Area to good condition. Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ² . In the long term, provide habitat to support 1,158 AUMs of big game use, in conformance with other objectives of the RMP. In the long term, within the Diamond Hills HMP Area, improve 3,136 acres of terrestrial big game habitat to good and 523 acres to excellent condition. Manage upward trends on 3,920 acres ³ . In the short term, within the Diamond Hills HMP Area, improve 35 acres of riparian/waterfowl habitat to good condition ³ . In the long term, within the Diamond Hills HMP Area, improve 40 acres of riparian/waterfowl habitat to good condition ³ . Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.
Union Mountain (I)	TU	1,488	469	Manage rangeland habitat and forage condition to support 1,110 AUMs for reasonable numbers of mule deer. Maintain or improve to at least good condition all mule deer crucial habitat. Manage rangeland to protect or enhance crucial greater sage-grouse strutting or nesting habitat. Improve and maintain meadow and riparian areas for mule deer and greater sage-grouse. Utilization levels will not exceed 50 percent on meadow and riparian areas.

Allotment ¹	Field Office	Active Livestock Use (AUMs) ⁴	Wildlife Use (AUMs)	Wildlife Management Objectives
Bruffy (I)	TU	1,731	231	<p>Manage rangeland habitat and forage condition to support 460 AUMs for reasonable numbers of mule deer.</p> <p>Maintain or improve to at least good condition all mule deer crucial habitat.</p> <p>Manage rangeland to protect or enhance crucial greater sage-grouse strutting or nesting habitat. Improve and maintain meadow and riparian areas for mule deer and greater sage-grouse.</p> <p>Utilization levels will not exceed 30 percent on meadow and riparian areas.</p>
Mineral Hill (I)	TU	1,555	137	<p>Manage rangeland habitat and forage condition to support 276 AUMs for reasonable numbers of mule deer.</p> <p>Maintain or improve to at least good condition all mule deer crucial habitat.</p> <p>Manage rangeland to protect or enhance crucial greater sage-grouse strutting or nesting habitat. Improve and maintain meadow and riparian areas for mule deer and greater sage-grouse.</p> <p>Utilization levels will not exceed 50 percent on meadow and riparian areas.</p>
Flynn/Parman (I)	ML	1,399	582	<p>Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas^{2,3}.</p> <p>In the long term, provide habitat to support 565 AUMs of big game use, in conformance with other objectives of the RMP.</p> <p>Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.</p>
JD (M)	ML	8,200	594	<p>Fenced riparian habitat along Tonkin Creek will receive no utilization.</p> <p>In the short term, improve 0.8 mile of riparian/aquatic habitat to good condition on Tonkin Creek including ten acres of riparian habitat.</p> <p>Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas^{2,3}.</p> <p>In the long term, provide habitat to support 1,289 AUMs of big game use, in conformance with other objectives of the RMP.</p> <p>Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.</p>
Roberts Mountain (I)	ML	13,238	1,735	<p>Utilization of riparian habitat to be improved would not exceed 50 percent on key species².</p> <p>In the short term, improve 15 miles of riparian or aquatic habitat to good condition on the following streams: seven miles of Roberts Creek; five miles of Vinini Creek; and three miles of Henderson Creek, including 180 acres of associated riparian habitat and 43 acres of other riparian habitat in the allotment.</p> <p>Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas².</p> <p>In the long term, provide habitat to support 2,450 AUMs of big game use, in conformance with other objectives of the RMP.</p> <p>Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.</p> <p>In the long term, within the Roberts Mountain HMP Area, improve 9,850 acres of terrestrial big game habitat to good and 473 acres to excellent condition. Stop downward trends on 3,256 acres and manage for upward trends on 10,811 acres³.</p>

Allotment ¹	Field Office	Active Livestock Use (AUMs) ⁴	Wildlife Use (AUMs)	Wildlife Management Objectives
North Diamond (C)	ML	4,151	436	Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ^{2,3} . In the long term, provide habitat to support 423 AUMs of big game use, in conformance with other objectives of the RMP. Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.
Three Mile (I)	ML	1,001	496	Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ² . In the long term, provide habitat to support 401 AUMs of big game use, in conformance with other objectives of the RMP. In the long term, within the Diamond Hills HMP Area, improve 2,004 acres of terrestrial big game habitat to good, and 23 acres to excellent condition. Stop downward trends on 466 acres and manage for upward trends on 2,097 acres ³ . Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.
Romano (I)	ML	2,887	519	Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ^{2,3} . In the long term, provide habitat to support 533 AUMs of big game use, in conformance with other objectives of the RMP. Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.
Black Point (I)	ML	4,633	2,450	Utilization of riparian habitat to be improved would not exceed 30 percent on key species ² . In the short term, improve 5.4 miles of riparian/aquatic habitat to good condition on the following streams: 3.2 miles of Cottonwood Creek; and 2.2 miles of Hildebrand Creek, including 65 acres of associated riparian habitat and 100 acres of other riparian habitat in the allotment. Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ² . In the long term, provide habitat to support 1,979 AUMs of big game use, in conformance with other objectives of the RMP. In the long-term, within the Diamond Hills HMP Area, improve 8,246 acres of terrestrial big game habitat to good and 375 acres to excellent condition. Manage for upward trends on 8,996 acres ³ . Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.
Spanish Gulch	ML			Managed with Shannon Station.
Lucky C (C)	ML	3,054	570	Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas ^{2,3} . In the long term, provide habitat to support 673 AUMs of big game use, in conformance with other objectives of the RMP. Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.

Allotment ¹	Field Office	Active Livestock Use (AUMs) ⁴	Wildlife Use (AUMs)	Wildlife Management Objectives
Santa Fe/ Ferguson (I)	ML	2,365	38	<p>Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas².</p> <p>In the long term, provide habitat to support 285 AUMs of big game use, in conformance with other objectives of the RMP.</p> <p>In the long term, within the Simpson Park HMP Area, improve 4,904 acres of terrestrial big game habitat to good and 157 acres to excellent condition. Stop downward trends on 1,308 acres and manage for upward trends on 5,257 acres³.</p> <p>Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.</p>
3 Bars (I)	ML	4,589	1,000	<p>Fenced meadows will receive no livestock utilization until the riparian habitat has achieved good condition. Thereafter, utilization not to exceed 35 percent on sedge and grasses along the stream bank.</p> <p>Utilization of unfenced riparian habitat to be improved and managed for good condition is 50 percent or less on key species².</p> <p>In the short term, improve and maintain in good condition 78 acres of riparian habitat.</p> <p>Utilization of key browse species not to exceed 50 percent in terrestrial big game habitat areas².</p> <p>In the long term, provide habitat to support 1,415 AUMs of big game use, in conformance with other objectives of the RMP.</p> <p>In the long term, within the Simpson Park HMP Area, improve 1,724 acres of terrestrial big game habitat to good, and 83 acres to excellent condition. Stop downward trends on 570 acres and manage for upward trends on 1,893 acres³.</p> <p>In the long term, within the Roberts Mountain HMP Area, improve 5,075 acres of terrestrial big game habitat to good and 243 acres to excellent condition. Stop downward trends on 1,678 acres and manage for upward trends on 5,570 acres³.</p> <p>Manage rangeland to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.</p>
Duckwater (I)*	EG	7,415	1,753	<p>Manage rangeland habitat and forage condition to support reasonable numbers of wildlife as follows: deer 2,313 AUMs; and antelope 510 AUMs.</p> <p>Maintain or improve mule deer and antelope habitats to good or better condition.</p> <p>Improve and maintain habitat condition of meadow and riparian areas in poor/good condition to good or better for pronghorn antelope, mule deer, and upland game.</p> <p>Utilization levels will not exceed 55 percent on perennial grasses and grass-like species and 45 percent on shrubs along stream riparian areas and mesic meadows.</p> <p>Protect greater sage-grouse breeding complexes. Protect ferruginous hawk nest sites.</p>
South Buckhorn (I)*	TU	7,497	566	<p>Manage rangeland habitat and forage condition to support 2,058 AUMs for reasonable numbers of mule deer.</p> <p>Maintain or improve to at least good condition all mule deer crucial habitat.</p> <p>Manage rangeland to protect or enhance crucial greater sage-grouse strutting or nesting habitat. Improve and maintain meadow and riparian areas for mule deer and greater sage-grouse.</p> <p>Utilization levels will not exceed 50 percent on meadow and riparian areas.</p>

Allotment ¹	Field Office	Active Livestock Use (AUMs) ⁴	Wildlife Use (AUMs)	Wildlife Management Objectives
Willow Ranch (M)*	ML	3,621	8	In the long term, provide habitat to support 159 AUMs of big game use, in conformance with other objectives of the RMP. Manage rangeland habitat to maintain or enhance greater sage-grouse strutting and nesting areas, in conformance with other objectives of the RMP.
Totals		102,525	31,391	

1 - Parenthetical after allotment name refers to BLM condition: I - improve the current unsatisfactory condition; M - maintain the current satisfactory condition; C - manage in a custodial fashion. ML = Mount Lewis Field Office; EG = Egan Field Office; TU = Tuscarora Field Office.

2 - Utilization limits refer to use by all herbivores. The utilization limits alone may only maintain existing conditions, but when coupled with other management practices, such as deferral and rest rotation grazing, are expected to allow for improvement of conditions.

3 - For those acres not identified for improvement, ecological conditions, wildlife habitat, and wild horse and burro habitat will be managed to prevent downward trends.

4 - AUMs were compiled from BLM Final Multiple Use Decisions and BLM grazing permits.

* - The asterisk identifies those allotments for which less than approximately one percent of the allotment is within the wildlife, special status species, and migratory birds CESA.

As noxious weed infestations are identified and determined a priority, the BLM and the Eureka County Weed District conduct weed control activities in the form of chemical treatment (Figure 4.3.4).

Four wild horse gathers have been completed within the Roberts Mountain HMA in 1987, 1995, 2001, and 2008. Prior to 2008, no formal gathers of wild horses had been conducted within the Whistler Mountain HMA by the BLM. In 2001, drought stressed horses were removed from the Whistler Mountain HMA in conjunction with the Roberts Mountain gather. The Kobeh Valley area outside the Fish Creek HMA was also gathered in 1994. Gathers of the Kobeh Valley outside the Fish Creek HMA were also completed in 2008.

4.3.4.2 Reasonably Foreseeable Future Actions

The 3-Bars Ecosystem and Landscape Restoration Project is a landscape scale restoration project that seeks to restore and enhance key vegetative communities, ecosystem functionality, and reduce fire risk over a 750,000-acre portion of central Eureka County. The need for change has been identified and documented using an interdisciplinary approach. Many factors have contributed to the overall decline of the 3 Bars ecosystem. Collectively, these factors incrementally increased the risk of loss of important ecosystem components. These components include the following: wildlife and habitat components; woodland and rangeland values; wetland and riparian components; as well as the integrated components that define Native American Traditional Values and cultural resource significance. Treatments would be proposed that address multiple objectives with multiple resource benefits. Treatments would potentially use a combination of passive, mechanical, chemical methods as well as prescribed fire applications to meet predetermined resource objectives. A decision on the 3 Bars EIS is expected, at the present time, in the third quarter of 2012.

It is reasonable to assume that weed identification, treatment, and monitoring would continue within the Immediate Watershed CESA.

Within the wildlife, special status species, and migratory birds CESA, as identified in the Shoshone-Eureka, Egan, and Elko RPSs and outlined in Table 4.3-1, a long-term goal is to increase AUMs available to wildlife by 5,601 AUMs and to improve 34,939 acres of big game habitat to good condition and 1,877 acres to excellent condition. Another long-term goal is to stop the downward trend on 7,278 acres and manage for upward trends on 38,544 acres.

It is reasonable to expect that the BLM would continue wild horse management activities in the form of gathers, AML review and adjustment, and implementation of habitat improvement projects.

4.3.5 Recreation

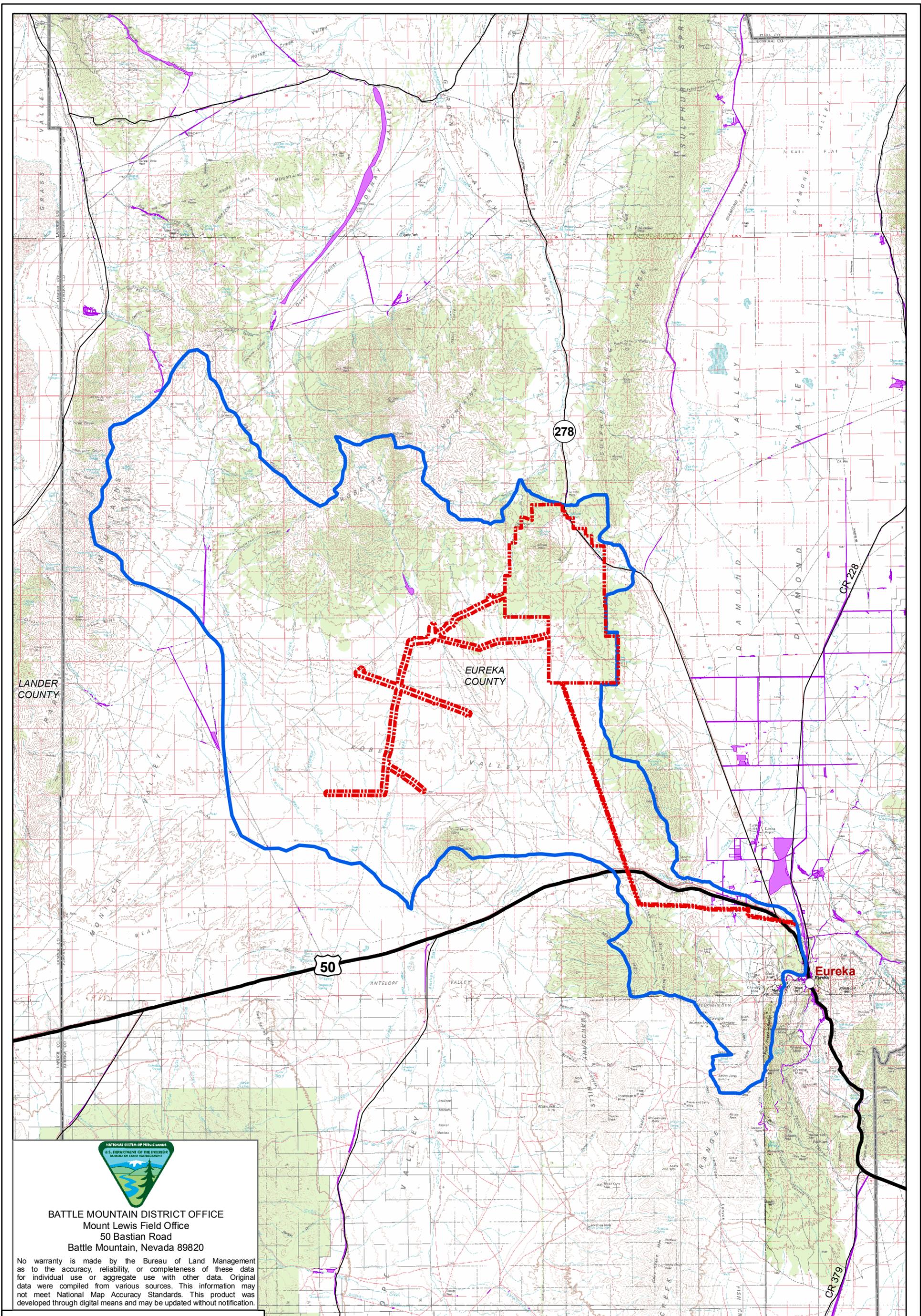
4.3.5.1 Past and Present Actions

Dispersed recreation opportunities include sightseeing, pleasure driving, rock collecting, photography, winter sports, off-highway vehicle use, mountain biking, picnicking, camping, fishing, hunting, and hiking. This wide range of opportunities is possible because virtually all of the public lands in the CESAs are accessible and offer a variety of settings suitable for different recreational activities. Developed recreational facilities are located at the Hickison Petroglyph Recreation Site, which is located approximately 24 miles east of Austin, Nevada, along U.S. Highway 50. The opportunities include petroglyph viewing, hiking, picnicking, hunting, horseback riding, and camping. Originally developed in 1968, the site has 16 camp sites, four picnic sites, three restrooms, and a 0.3 mile interpretive trail. One to five special recreation permits are approved each year. The majority of special recreation permits are for guided hunts. In addition, there is a Pony Express re-ride each year in June along the Pony Express National Historic Trail.

Dispersed recreational activities have not required major improvements for recreational purposes, as existing roads and trails are the primary facilities associated with these activities. Surface disturbance has occurred as a result of recreation activities and is either accounted for under other categories or the disturbance has not been quantified. There are three reservoirs in Pine Valley (Tonkin, Lower Tonkin, and JD), which total 60 acres and are on private and public lands.

4.3.5.2 Reasonably Foreseeable Future Actions

Recreational use within the CESA is likely to increase proportionally to changes in population, with dispersed outdoor recreational activities being the predominant type of recreation. In addition, construction is underway to develop a 30- to 50-mile hiker/equestrian trail system in the Simpson Park Range immediately north of the Hickison Petroglyph Recreation Site. An associated trailhead is completed. Equestrian camping facilities are also being contemplated in the area immediately adjacent to the existing campground. The design or layout of these proposed developments has not been developed.



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EXPLANATION

- Project Area Boundary
- Invasive Non-Native Species CESA
- Weed Treatment Areas



DESIGN: EMLLC	DRAWN: CVD/GSL	REVIEWED: RFD
CHECKED: _____	APPROVED: RFD	DATE: 09/29/2011
FILE NAME: p1635_Fig4-3-4_NoxiousWeeds.mxd		

BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT

DRAWING TITLE:
**Noxious Weed Occurrences within the
 Invasive Non-Native Species CESA**

Figure 4.3.4

4.3.6 Land Development

4.3.6.1 Past and Present Actions

The Town of Eureka comprises approximately 880 acres. The majority of the town area lies to the west of U.S. Highway 50. In addition, approximately 700 acres have been identified for residential or commercial development in the Diamond Valley area. The Town of Eureka and the Diamond Valley community consist of roads, residences, commercial and public buildings, powerlines, fences, and other related development.

In the current RMP, approximately 23,000 acres within Diamond Valley and the Project Area have been identified for disposal; however, no specific proposals for disposal have been identified.

Currently and in the past there have been minimal industrial activities within the CESAs with the exception of the mineral development activities discussed under Section 4.3.7. There is also a cement batch plant in the Town of Eureka.

4.3.6.2 Reasonably Foreseeable Future Actions

Future public land sales are considered possible under RFFAs. The BLM is currently evaluating a proposed 150-acre land sale associated with the Ruby Hill Mine. Other potential land sales could include lands associated with community development or specific resource development projects, such as the Proposed Action. Any future land sales that were not within disposal areas identified in the current RMP would be subject to congressional requirements in the implementing legislation. Public lands converted to private ownership would be subject to all applicable state environmental laws. If a land sale involved community development land, there would likely be a future change in use from wildlife habitat to residential and commercial development. If a land sale involved a resource development project, current resource activities would likely continue into the future with possible expansion. Long-term use of the land after the resource activity has been completed may be an activity or use other than livestock grazing and production and wildlife habitat, which would be the use if the land remained under BLM management. Long-term use of privatized land would be subject to any covenants agreed to at the time of sale. There is potential for the development of a residential area on private land in Kobeh Valley at the Bartine Ranch and in Pine Valley at the JD Ranch.

A major portion of the Project Area is identified in the RMP for disposal; therefore, it is reasonable that this portion of the Project Area would become private land through a RFFA by the BLM to sell the land. Information on areas identified for disposal can be found on the BLM MLFO website (http://www.blm.gov/nv/st/en/fo/battle_mountain_field/blm_programs/planning/resource_management.html).

4.3.7 Mineral Development and Exploration

4.3.7.1 Past and Present Actions

Based on information from the Eureka County and White Pine County reports by the Nevada Bureau of Mines and Geology, there are ten historic mining districts that occur within the

geology and minerals CESA in Eureka County: Alpha; Antelope; Diamond; Eureka; Fish Creek; Lone Mountain; Mineral Hill; Mount Hope; Roberts; and Union (Roberts et al. 1967). There is one historic mining district that occurs within the geology and minerals CESA in White Pine County, Newark (Hose and Blake 1976). The Alpha District is located in the Sulphur Springs Range north of the Project Area. It was likely active prior to 1900; however, records indicate a small production of Ag, with Pb, Zn, and Cu between 1909 and 1917. The Antelope District is located on the western flank of the Roberts Mountains and was discovered in the 1860s or 1870s. In 1950 and 1951 production included 261 ounces of Ag, as well as Pb and Zn for a total value of \$25,604 (1952 dollars). The Diamond District is located north of the Town of Eureka on the west flank of the Diamond Mountains and was discovered in 1864. Very limited mining occurred prior to 1936. Between 1936 and 1955, 31 ounces of Au and 51,898 ounces of Ag, as well as Cu, Pb, and Zn were produced for a total value of \$184,520 (1955 dollars).

The Eureka District, which is located in the vicinity of the Town of Eureka, was the most productive district in the area with a total production value of \$122 million (1962 dollars). Production included Au (148,283 ounces), Ag (3,173,838 ounces), Cu (2,079,408 pounds), Zn (14,276.131 pounds), and Pb (60,589,509 pounds).

The Fish Creek District is located southwest of the Town of Eureka in the Fish Creek Range and the Mahogany Hills and was discovered in the late 1800s. Production has been very limited. In 1938, Ag (238 ounces) and Pb were produced at a value of \$400 (1938 dollars). In 1955, Au (233 ounces) and Pb were produced at a value of \$1,239 (1955 dollars).

The Lone Mountain District is located on the north flank of Lone Mountain and was discovered in 1920. Production of Zn (4,952,627 pounds) along with Ag (4,040 ounces), Cu, and Pb from 1938 to 1964 had a value of \$781,102 (1964 dollars).

The Mineral Hill District is located on the northwest flank of the Sulphur Springs Range and was discovered in 1868. Production in the district occurred through 1938 with gold (145 ounces), Ag (71,250 ounces), Cu, Pb, and Zn. The total value of the production was \$2,500,662 (1938 dollars).

The Mount Hope District is located on the southeast flank of Mount Hope and is the location of the Project. The district was discovered in 1870. Production occurred between 1941 and 1947 with the principal product being Zn (10,189,454 pounds), along with Au (83 ounces), Ag (63,697 ounces), Cu (57,675 pounds), and Pb (441,103 pounds). The total value was \$1,335,393 (1947 dollars).

The Roberts District is located on the west flank of the Simpson Park Mountains and was discovered in 1870. Minor production occurred around 1910. Between 1948 and 1962 Au (114 ounces), Ag (417 ounces), Cu, Pb, and Zn were produced with an approximate value of \$5,961 (1962 dollars).

The Union District is located on the north flank of the Sulphur Springs Range and was discovered in 1886. The main production occurred between 1915 and 1918 with a value of \$175,802 (1918 dollars). In 1951, production included Ag (375 ounces) and Pb with a value of \$1,896 (1951 dollars) and in 1952 production of Ag (381 ounces) and Pb with a value of \$1,221 (1952 dollars).

The Newark District is located on the eastern flank of the Diamond Mountains and was discovered in 1866. Production occurred sporadically between 1867 and 1957. Between 1942 and 1944 W ore production was valued at \$73,000. The total value of the historic production in 2006 dollars (using the CPI to adjust for inflation) is \$870,681,793 for the Newark District. This value is likely conservative because data from the districts with multiple years of production were adjusted for inflation based on the last year of production. Surface disturbance associated with these operations has not been quantified; however, the value is likely in the range of several hundreds to a few thousand acres.

From the mid-1960s up to the present, mineral resource development within the CESA has principally been gold production from four mining operations: Gold Bar, Windfall, Tonkin Springs, and Ruby Hill. The Antelope district in the southern Roberts Mountains contains one main Au deposit (Gold Bar), five satellite deposits, and other resources. The Gold Bar deposit was discovered in 1983 and approximately 500,000 ounces of Au have been recovered from a resource of 1.6 million ounces. The properties are currently in closure. The Ruby Hill mine is located in the Eureka mining district and is currently operating. The West Archimedes portion of the Ruby Hill mine produced 755,000 ounces of Au between 1997 and 2002. Additional mineralized areas, including East Archimedes, Deep East, and Achilles, have been identified. The East Archimedes deposit at Ruby Hill had approximately 1.08 million ounces of proven and probable Au reserves at year end 2006. The Windfall-Rustler and Lookout Mountain (Ratto Canyon) mines are located in the southern portion of the Eureka mining district and exploration is currently ongoing. Gold production of 200,000 ounces was recorded in 1993. The Tonkin Springs Mine property is located in the Roberts Mining District. Small scale mining and exploration occurred in the 1990s. A total of 100,000 ounces of Au reserve was defined in the early 2000s; however, no recent mining has occurred. The Tonkin Springs Mine is currently in closure.

Current minerals activities within all the CESAs are shown on Figure 4.3.5. There are approximately 73 Notice-level operations and 18 plans of operations that are authorized under 43 CFR 3809 by the BLM. The total surface disturbance associated with these operations is 15,114 acres. This value includes the gold producing operations from the 1980s and 1990s.

4.3.7.2 Reasonably Foreseeable Future Actions

An additional 11,958 acres of surface disturbance is reasonably foreseeable for future minerals activities.

4.3.8 **Hazardous/Solid Waste and Hazardous Materials**

4.3.8.1 Past and Present Actions

The past uses of hazardous materials include chemicals used at the historic Mount Hope mines. Use of these chemicals ceased in the 1950s, and any stored chemicals were removed by EML. Other past uses of hazardous materials include fuels and other petroleum products associated with the mining and exploration activities, which were used to maintain and operate the mining and exploration equipment and vehicles. Vehicles using SR 278 contain petroleum products. Maintenance of SR 278 by the NDOT has included the application of herbicides annually within the highway ROW to minimize vegetation. It is likely that some petroleum products have been

spilled as the result of vehicle accidents on SR 278; however, the amounts are not readily quantifiable. SR 278 has been used in the past to transport hazardous materials, including petroleum, to nearby mining operations, towns, and ranches. Currently, there are approximately ten loads per day of fuels, cyanide solutions, acid, and explosives transported on SR 278 and U.S. Highway 50 (Enviroscientists 2011b).

There is a Class III waived landfill associated with the Ruby Hill Mine, which is within the one-mile buffer around the Hazardous Materials and Transportation and Access CESA. This landfill has been operated since the 1990s and only accepts non-liquid, non-hazardous, or non-putrescible wastes from the mining operation. The Eureka County Landfill, located to the northeast of the Town of Eureka, accepts non-hazardous wastes at an approximate average rate of 20 tpd and has a total area of approximately 40 acres. The BLM and Eureka County are currently working on plans to expand the landfill.

4.3.8.2 Reasonably Foreseeable Future Actions

It is reasonable to expect that SR 278 would continue to be used as a transportation route for hazardous materials at levels that are consistent with, or somewhat greater than, current levels. In addition, the NDOT would continue with their application of herbicides within the SR 278 ROW. It is expected that the landfills at the mining operations would maintain their current size for the duration of the cumulative analysis; however, it is reasonable to expect that the Eureka Landfill would have up to a three-fold expansion in size and capacity.

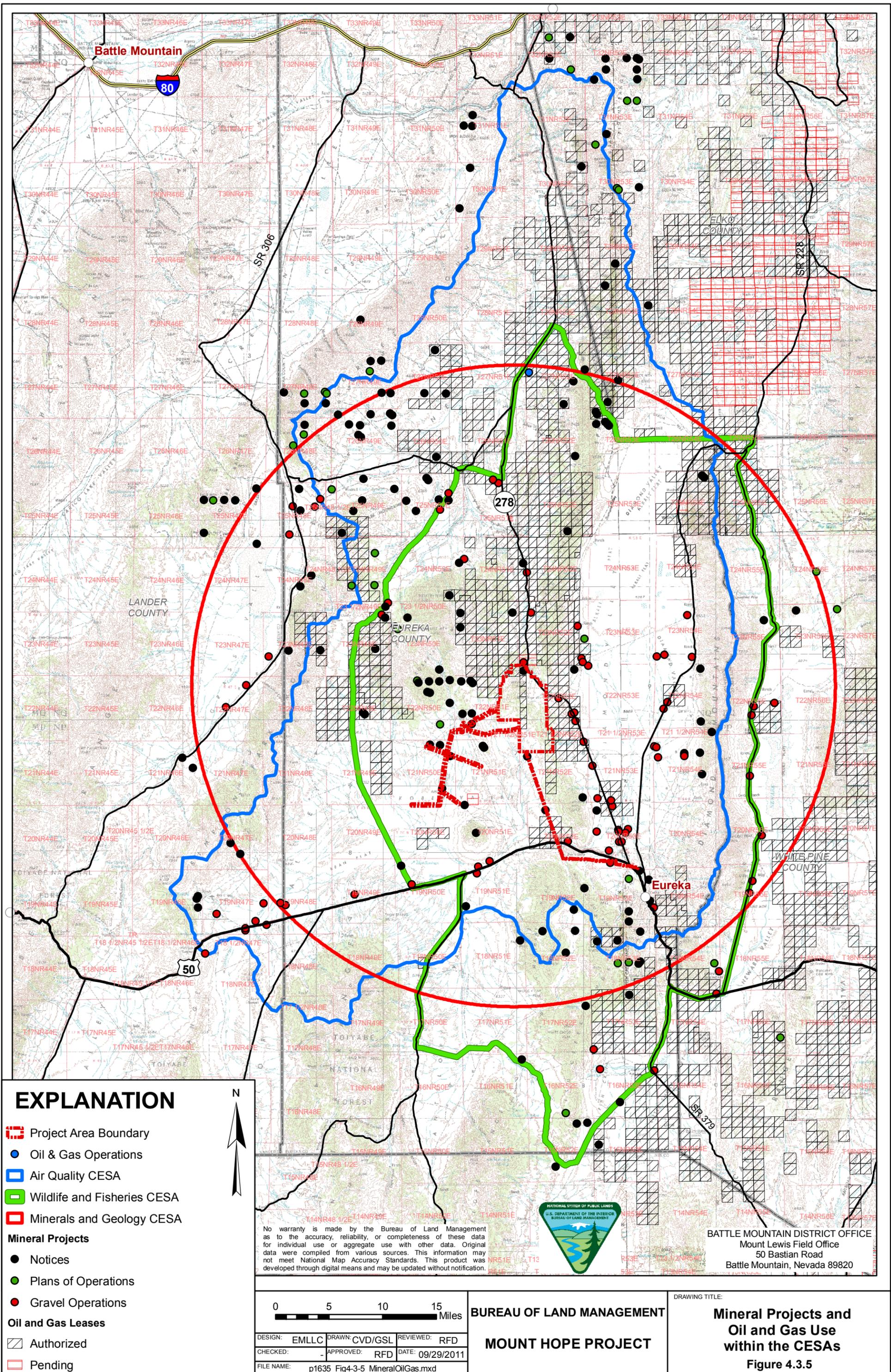
4.3.9 **Oil, Gas, and Geothermal Leasing and Development**

4.3.9.1 Past and Present Actions

As shown on Figure 4.3.5, there are oil and gas leases throughout the CESAs for air, minerals, and wildlife. In addition, four oil fields have been developed in Pine Valley located in the northern portion of the minerals CESA (shown as a blue dot on Figure 4.3.5). All four of these oil fields are located within the area of Eureka County administered by the Elko BLM and had a production of 3,369,329 barrels between 1990 and 2006.

Approximately 283 acres of surface disturbance is associated with the current oil and gas development. There is also one project involving drilling and exploration in Sections 7 and 9, T27N, R52E.

The CESAs overlap the area analyzed in the EA for Oil and Gas Leasing within Portions of the Shoshone-Eureka Planning Area (NV063-EA06-092) (BLM 2006). The assessment area in that EA includes the eastern portion of the Shoshone-Eureka Planning Area with lands in the southern CESA portions of Eureka and Nye Counties. According to the Nevada Bureau of Mines and Geology Bulletin 104, historic interest in oil and gas exploration within the area has been limited (Garside et al. 1988). Between 1946 and 2004, 39 exploration wells were drilled (<http://www.nbmng.unr.edu> 2006). None of these wells resulted in production. The discovery of oil in Blackburn Field in Pine Valley in 1982 led to exploration interest in Eureka County, which had not seen interest prior to 1982. Although four oil fields have been developed within the area of Eureka County administered by the Elko BLM, no production wells have been developed within other portions of Eureka County. Production in the Railroad Valley area of Nye County



EXPLANATION

- Project Area Boundary
- Oil & Gas Operations
- Air Quality CESA
- Wildlife and Fisheries CESA
- Minerals and Geology CESA

Mineral Projects

- Notices
- Plans of Operations
- Gravel Operations

Oil and Gas Leases

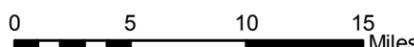
- Authorized
- Pending



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DESIGN: EMLLC	DRAWN: CVD/GSL	REVIEWED: RFD
CHECKED: _____	APPROVED: RFD	DATE: 09/29/2011
FILE NAME: p1635_Fig4-3-5_MineralOilGas.mxd		

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MOUNT HOPE PROJECT

DRAWING TITLE:
Mineral Projects and Oil and Gas Use within the CEsAs
 Figure 4.3.5

led to increased interest as well; however, as of 2004, no exploration wells had been drilled in the Nye County portion of the CESAs.

As described in EA NV063-EA06-092, the overall potential for oil and gas exploration and development within the CESAs would be moderate to high because it is on a trend between the Pine Valley and Railroad Valley production wells. In addition, oil and gas interest has been increasing in the area. In the assessment area for EA NV063-EA06-092, an average of one exploration well was drilled per year between the years of 1980 and 2004 versus a total of 13 exploration wells drilled in the 33 years prior. Exploration interest since 1980 has focused specifically on Eureka County.

There are currently no geothermal leases within the CESAs.

4.3.9.2 Reasonably Foreseeable Future Actions

As energy demands increase and advancements in exploration and drilling technology lead to development of previously unexplored resources, oil and gas leasing and exploration are likely to increase. Increased economic incentive may also lead to an increase in exploration and development as oil prices rise. EA NV063-EA06-092 assumes that an estimated two wells would be drilled each year over the next ten years and that one of the 20 wells would be viable for production. Based on this assumption, the total surface disturbance from exploration activity is estimated at 290 acres; exploratory well pad construction is estimated at 40 acres; disturbance from development of access roads is estimated at 240 acres; and gravel pit expansion associated with exploration is estimated at 2.5 acres. Surface disturbance from oil and gas exploration could total a maximum of 572.5 acres, of which 16.5 acres would not be reclaimed within the ten year scenario. The total surface disturbance from the nine production well pads is estimated at 18 acres; disturbance from the construction of production roads is estimated at 34 acres; and gravel pit expansion for oil and gas production is estimated at 2.5 acres. Surface disturbance from oil and gas production over the ten-year planning period could total a maximum of 54.5 acres. For the portion of the oil and gas field that is within the Elko BLM jurisdiction the leasing of parcels for oil and gas is expected to continue in the future as energy demand continues to increase. No exploration or development permit applications for projects in the CESA have been submitted to the BLM. It is likely that there would be additional disturbance associated with oil and gas exploration and development in that region. All future proposed actions within the CESAs would be analyzed when a lessee submits plans for the action.

4.3.10 Summary of Surface Disturbance

The total surface disturbance associated with all past and present actions, as outlined above and summarized in Table 4.2-3, is 391,608 acres. The total surface disturbance associated with all RFFAs, as outlined above and summarized in Table 4.2-3, is 149, 871 acres. Therefore, the total surface disturbance associated with all past actions, present actions, and RFFAs is 530,467 acres. The total surface disturbance associated with the Proposed Action is 8,318 acres.

4.4 Evaluation of Potential Proposed Action Cumulative Impacts

This section presents descriptions of the collective or additive impacts of combining past, present, and RFFAs associated with mineral development and other land uses in the southern

Eureka County area. Past, present, and reasonably foreseeable future land uses and human caused and natural occurrences are described in Section 4.3. Potential cumulative effects for some resources are based on predictive modeling results (air quality and water quality/quantity) as described below.

Criteria for assessing the significance of potential impacts to the resources are the same as those presented in Chapter 3.

4.4.1 Water Resources - Water Quantity

Cumulative impacts to water resources within the study area are considered from surface water, ground water, and water quantity perspectives. Assessment of cumulative impacts from present actions and RFFAs that are developed would be incorporated into the ground water flow model and pit lake chemistry model as specific activities and associated water resource impacts evolve and are quantified by data collection under the Integrated Monitoring Plan, as outlined in Section 2.1.16 of this EIS.

4.4.1.1 Surface Water Quantity

Past Actions - The past actions that had the potential to affect surface water resources were mining-related and grazing-related actions. The past mining operations were of smaller scale and consisted of underground operations with limited surface disturbance. The other past actions that had the potential to affect surface water resources were agriculture related ground water pumping in Diamond Valley, which commenced in the late 1950s, and has associated indirect effects on spring and stream flows.

Present Actions - The present and Proposed Actions that would potentially affect surface water resources are grazing and mining-related actions. Through consumption and ground disturbance, grazing by livestock and wild horses can affect surface water resources. These present mining related actions are surface mining operations that affect surface water resources by the pumping of ground water and associated indirect effects on spring and stream flows.

RFFAs - The RFFAs that have the potential to affect surface water resources are also grazing and mining-related actions. Through consumption and ground disturbance, grazing by livestock and wild horses can affect surface water resources. These RFFA mining-related actions would likely be surface mining operations that affect surface water resources by the pumping of ground water and associated indirect effects on spring and stream flows.

Cumulative activities indirectly affecting the surface water resources through the pumping of ground water was evaluated with ground water modeling of the cumulative actions that were modeled through the year 2055 (Montgomery et al. 2010). Figure 4.4.1 depicts the ten-foot drawdown contour for the cumulative actions scenario. This analysis identifies a number of springs on the western flank of the Diamond Mountains, the northern end of Diamond Valley, in the Roberts Mountains and in Kobeh Valley that are within the ten-foot drawdown contour and thus their flows would be potentially diminished.

The cumulative impacts to surface water resources from the Proposed Action and RFFAs for ground water development would be significant. The Proposed Action portion of the cumulative

impacts is also considered significant and specific mitigation measures for the Proposed Action effect are identified in Section 3.2.3.3. The cumulative actions, exclusive of the Proposed Action, particularly the agricultural actions in Diamond Valley also have a significant effect on the surface water resources in Diamond Valley. No mitigation measures are proposed for the effects of this agricultural activity because the BLM does not have any regulatory authority over those actions.

4.4.1.2 Ground Water Quantity

Past Actions - The past actions that had the potential to affect ground water resources were principally agriculture related ground water pumping in Diamond Valley, which commenced in the late 1950s. Other past actions that affect ground water included domestic production in the Town of Eureka and the surrounding area ranches in Diamond Valley, Kobeh Valley, and Pine Valley, ground water pumping for livestock use, and mineral production in the Eureka Mining District and at Mount Hope.

Present Actions - The present and Proposed Actions that would potentially affect ground water resources are the continued pumping for agriculture and domestic uses in Diamond Valley, Kobeh Valley, and Pine Valley, as well as mining-related actions in the Eureka Mining District. Ground water pumping for livestock use, wild horse use, and wildlife use is another set of present actions affecting ground water resources.

RFFAs - The RFFAs that have the potential to affect ground water resources are also agricultural, domestic use, livestock use, wild horse use, wildlife use, and mining-related actions. These RFFAs would likely continue to pump ground water from Diamond Valley, Kobeh Valley, and Pine Valley. For the analysis in this portion of the EIS it is assumed that the present actions would continue pumping at the authorized rates under the RFFA scenario.

Ground water modeling of the cumulative activities affecting the ground water resources was conducted through year 2055 (Montgomery et al. 2010). Figure 4.4.1 depicts the ten-foot drawdown contour for the cumulative actions scenario. This analysis identifies a number of wells in Diamond Valley and Kobeh Valley that are within the ten-foot drawdown contour and thus their flows would be potentially diminished.

The cumulative impacts to ground water resources from the Proposed Action and RFFAs for ground water development would be significant. The Proposed Action portion of the cumulative impacts is also considered significant and specific mitigation measures for the Proposed Action effects are identified in Section 3.2.3.3. The cumulative actions, exclusive of the Proposed Action, particularly the agricultural actions in Diamond Valley also have a significant effect on the ground water resources in Diamond Valley. No mitigation measures are proposed for these effects because the BLM does not have any regulatory authority over those actions.

4.4.2 Water Resources - Water Quality

Cumulative impacts to water resources within the study area are considered from surface water, ground water, and water quality perspectives. Assessment of cumulative impacts from present actions and RFFAs that are developed would be incorporated into the periodic ground water flow

model and pit lake chemistry model updates as specific activities and associated water resource impacts evolve and are quantified by data collection under the Integrated Monitoring Plan.

4.4.2.1 Surface Water Quality

Past Actions - The past actions that have affected surface water resources are primarily mining, ranching, wild horse actions, and agricultural operations. Past mining operations were of a smaller scale and consisted of underground operations with limited surface disturbance.

Present Actions - The present and Proposed Actions that would potentially affect surface water resources are wild horse use, grazing and mining-related actions, as well as dispersed recreation. These present mining related actions are surface mining operations that affect surface water resources by excavating, modifying, or covering existing topographic and geomorphic features and by changing surface erosion characteristics. The present grazing and dispersed recreation actions affect surface water resources by removing vegetation and decreasing bank stability near streams and springs.

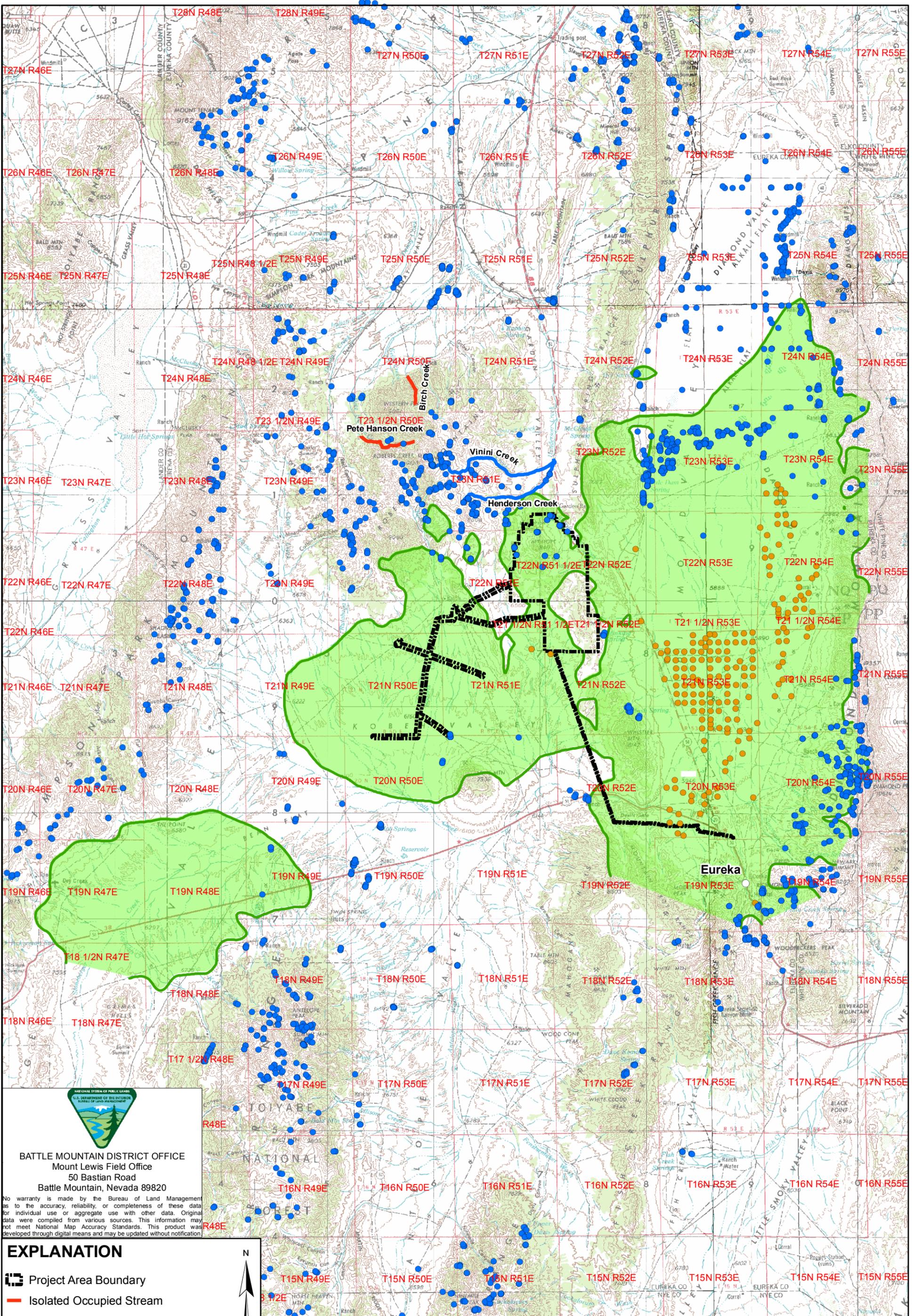
RFFAs - The RFFAs that have the potential to affect surface water resources are also wild horse use, grazing, and mining-related actions. These RFFA mining-related actions would likely be surface mining operations that affect surface water resources by excavating, modifying, or covering existing topographic and geomorphic features and by changes to surface erosion characteristics. The RFFA grazing actions affect surface water resources by removing vegetation and decreasing bank stability near springs and streams.

The past, present, and RFFAs would potentially directly affect surface water resources through increased erosion and sedimentation. The mining-related cumulative actions would be required to implement erosion control measures that would limit their contribution to the cumulative impacts. Grazing has its own set of requirements that minimizes effects to surface water quality. Dispersed recreation actions would not have the same requirements and thus would have a proportionally greater affect on surface water resources by removing vegetation and decreasing bank stability near streams and springs.

4.4.2.2 Ground Water Quality

Past Actions - The past actions that had the potential to affect ground water quality were principally mining operations in the Eureka Mining District and at Mount Hope as well as agriculture related operations in Diamond Valley, which commenced in the late 1950s. Other past actions that affect ground water quality included activities associated with the Town of Eureka and the surrounding area ranches in Diamond Valley, Kobeh Valley, and Pine Valley. All these activities had the potential to discharge chemicals or materials that could migrate into the ground water and decrease ground water quality.

Present Actions - The present and Proposed Actions that would potentially affect ground water resources are the continued agriculture and domestic related activities in Diamond Valley, Kobeh Valley and Pine Valley, as well as mining-related actions in the Eureka Mining District. All these activities had the potential to discharge chemicals or materials that could migrate into the ground water and decrease ground water quality. In addition, the Ruby Hill Mine, which is located in the southern portion of Diamond Valley would create a pit lake at the end of mining.





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- EXPLANATION**
-  Project Area Boundary
 -  Isolated Occupied Stream
 -  Recovery Reach
 -  Spring/Seep
 -  Well
 -  10-Foot Drawdown Contour Maximum Extent
 -  Cumulative Action Scenario

0 1 2 3 4 5 Miles

DESIGN: EMLLC	DRAWN: GSL	REVIEWED: RFD
CHECKED: -	APPROVED: -	DATE: 05/12/2011
FILE NAME: p1635_Fig4.4.1_Cumulative10footDrawdown.mxd		

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DRAWING TITLE:
Cumulative Action Scenario - Projected Water Table Drawdown at Project Year 44, End of Year 2055, Relative to Pre-Development (1955) Conditions
Figure 4.4.1

The potential affects to ground water quality from this pit lake are discussed in the Ruby Hill Mine Expansion - East Archimedes Project Final Supplemental EIS (BLM 2005), which is incorporated herein by reference. The pit lake would be a terminal lake and act as a ground water sink.

RFFAs - The RFFAs that have the potential to affect ground water resources are the continued agriculture and domestic related activities in Diamond Valley, Kobeh Valley, and Pine Valley, as well as mining-related actions in the Eureka Mining District. All these activities would have the potential to discharge chemicals or materials that could migrate into the ground water and decrease ground water quality.

Any potential cumulative impacts to ground water quality from the Proposed Action, along with the past and present actions and the RFFAs for ground water would not be significant, based on the criteria above. The only two actions that have a quantitative assessment of potential ground water quality impacts are the Proposed Action and the Ruby Hill Mine. Both of these actions have ground water quality impacts that are not significant based on the analyses in this EIS and in BLM (2005).

4.4.3 Geology and Mineral Resources

Past Actions - The past actions that had the potential to affect geology and mineral resources were mining-related actions. Most past mining operations were of a smaller scale and consisted of underground operations with limited surface disturbance. Most geology and mineral impacts resulted from a limited amount of mineral resource development activities, except for those activities in the vicinity of Eureka, which are outlined in Section 3.4.2. Historically, this area has been mined for Au, Ag, Pb, Cu, and Zn.

Present Actions - The present and Proposed Actions that would potentially affect geology and mineral resources are mining-related actions. These present mining related actions are surface mining operations that affect geology and mineral resources by excavating, modifying, or covering existing topographic and geomorphic features and by removing mineral resources.

RFFAs - The RFFAs that have the potential to affect geology and mineral resources are also mining-related actions. These RFFA mining-related actions would likely be surface mining operations that affect geology and mineral resources by excavating, modifying, or covering existing topographic and geomorphic features and by removing mineral resources.

Mining disturbance has included open pit and underground operations with WRDFs, heap leach ore processing, ore milling and processing, tailings disposal, and exploration (drilling, trenching, sampling, and road construction). Past, present and proposed disturbance is 14,434 acres, and approximately 1,147 acres of disturbance is anticipated under the RFFAs. This totals 15,581 acres of disturbance within the 1,809,522-acre CESA, which is 1.5 percent of the area.

Mining is a major activity in the area, and it is likely that exploration activities and mining would continue. Additional impacts would result from the creation in the foreseeable future of additional open pit mining operations with WRDFs and processing facilities. The direct impacts affecting geology and mineral resources of the Proposed Action due to the open pit mining would be the permanent removal of the identified mineral resources. The cumulative impacts to

geology and mineral resources from the Proposed Action and RFFAs for mineral development would not be significant. No mitigation is proposed.

4.4.4 Air Resources

Past Actions - Prior to the implementation of the CAA, few if any measures to control or minimize impacts to air quality were required. Most mining operations were of smaller scale and consisted of underground operations with small disturbance footprints. Most air quality impacts from these operations consisted of the generation of fugitive dust during exploration road building, trenching, and mining operations, as well as agricultural operations and travel on dirt roads. An exception to this was the mineral processing operation in the Eureka area, which included furnaces that were fueled with locally produced charcoal. Air quality impacts from these operations were substantial, consisting of heavy particulates and metal emissions. In addition, the locally produced charcoal was generated by burning (baking) cut and stacked piñon and juniper trees, which generated particulate and VOC emissions. Another action that affects Air Resources is wildland fires, which contribute substantial amounts of particulates.

Present Actions - All the present emissions, including the Proposed Action, are located within the Diamond Valley, Kobeh Valley, and Pine Valley air basins. Impacts to air quality from mining-related activities would include the generation of fugitive dust from blasting, exploration drilling, road building, haul truck operations, and mining operations. Other air emissions would be generated from processing facilities and the burning of fossil fuels by heavy equipment and other vehicles, travel on dirt roads, recreation, and wildland fires. Agricultural operations and commercial operations also generate fugitive dust and combustion emissions.

RFFAs - Air quality impacts from RFFAs could include generation of fugitive dust during hard rock exploration, mineral development, and the development of oil and gas or geothermal operations. Emissions may also be generated from processing facilities, burning of fossil fuels by heavy equipment and other vehicles, vehicle travel on paved and unpaved roads, fugitive dust from travel on unpaved roads, and wildland fires. Some of these emissions would be localized and subject to BAPC air quality permits and compliance, development of mitigation measures, and implementation of operational performance standards. Others would be more long term and basin wide.

Each of the identified individual projects within the CESA, including existing and proposed mining operations, emit air pollutants. With the possible exception of motor vehicle emissions, the existing and proposed mining operations are the major sources of criteria pollutants within the CESA. The modeling for the Proposed Action, as well as the Ruby Hill Mine, shows that the levels of these pollutants are below the applicable standards. The Proposed Action would not result in a significant cumulative impact to air resources. The RFFAs would result in additional emissions similar to those currently emitted by the existing operations within the CESA. In addition, the major sources of pollutants (except for motor vehicle emissions) within the CESA would operate under permit conditions established by the BAPC and therefore would not be significant.

4.4.5 Visual Resources

Past Actions - The past actions that had the potential to affect visual resources were mining-related actions. The past mining operations were of a small (Mount Hope underground) to moderate (Gold Bar Mine and Eureka Mining District) scale and consisted of underground and surface operations with limited to substantial surface disturbance. Other past actions include roads, powerlines, and buildings. Most visual resource impacts resulted from surface disturbance associated with the actions and the structures created by the actions.

Present Actions - The present and proposed actions that had the potential to affect visual resources are mining-related, agriculture related, and general development actions. The present mining operations include the Ruby Hill Mine, which is a surface operation with substantial surface disturbance. Most visual resource impacts resulted from surface disturbance associated with the actions and the structures created by the actions.

RFFAs - The RFFAs that had the potential to affect visual resources would be a continuation to the present mining-related, agriculture-related, utilities and infrastructure, and general development actions. Most visual resource impacts resulted from surface disturbance associated with the actions and the structures created by the actions.

Mining disturbance has included open pit and underground operations with WRDFs, heap leach ore processing, ore milling and processing, tailings disposal, and exploration (drilling, trenching, sampling, and road construction). Past surface disturbance is 200 acres, the present and proposed disturbance is 12,714 acres, and approximately 1,147 acres of disturbance is anticipated under the RFFAs. Past and present actions, as well as RFFAs associated with agricultural actions have surface disturbance totaling approximately 29,496 acres. Past and present actions, as well as RFFAs associated with utilities and infrastructure actions have surface disturbance totaling approximately 51,823 acres. Past and present actions, as well as RFFAs associated with general development actions have surface disturbance totaling approximately 16,074 acres. These actions total approximately 122,266 acres of disturbance within the approximately 645,000-acre CESA for visual resources.

There are many actions that have an effect on the visual resources within the vicinity of the Project Area. The BLM's visual management for the Project Area allows for substantial change to the visual characteristics of the area. In addition, VRM classes do not establish management direction and should not be used as a basis for constraining or limiting surface disturbing activities. Therefore, the cumulative impacts to visual resources from the Proposed Action, along with the past and present actions and the RFFAs would not be significant; however, activities to minimize the visual effects are incorporated in the Project reclamation plan.

4.4.6 Soils

Past Actions - Past or historic mining operations within the study area include a few operations from the 1860s through the 1970s, as well as modern operations from the 1980s. It appears that essentially all of the historic mining operations within the study area occurred in the Eureka Mining District. The disturbance to vegetation is estimated to be approximately 200 acres. None of that disturbance was reclaimed. The more modern operations within the study area include the Gold Bar Mine and the Ruby Hill Mine, which together total approximately 1,343 acres of

surface disturbance to vegetation. The Gold Bar Mine operated between the 1980s and 1990s and only a portion of the operation was reclaimed, which included the redistribution of stockpiled growth media and reestablishment of soil resources and vegetation. The Ruby Hill Mine began operations in the 1990s and is currently in operation. Portions of the mine have undergone concurrent reclamation, including the redistribution of growth media and the reestablishment of soil resources. Other past actions that have affected soils resources include the development of roads, powerlines and other utilities, dispersed recreation, fences, development of cattle and wild horse water sources, agricultural activities, and land development and are estimated at 550 acres of surface disturbance that affect soil resources. Impacts to soil resources from these activities include burial, compaction, mixing, and erosion. The extent of these impacts varies with the type of activity.

Present Actions - Present actions include the ongoing Ruby Hill Mine, discussed above, as well as exploration activities under 153 notices and 22 plans of operations. These are estimated at 13,669 acres that are not otherwise included under the past actions. The Proposed Action would include 8,318 acres of surface disturbance to soil resources. Other present actions that have an effect to soil resources are a continuation of those activities outlined under past actions. Impacts to soil resources from these activities include burial, compaction, mixing, and erosion. The extent of these impacts varies with the type of activity.

RFFAs - RFFAs within the study area could result in up to approximately 14,058 acres of surface disturbance that would affect soil resources. These activities include up to 1,147 acres of surface disturbance associated with mineral operations and 5,377 acres associated with land sales and their subsequent development. Impacts to soils resources from these activities include burial, compaction, mixing, and erosion. The extent of these impacts varies with the type of activity.

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect soil resources. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements either because of their perpetual nature or lack of state or federal statutory requirements for reclamation. The CESA for soil resources covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the soil resources within the CESA.

4.4.7 Vegetation Resources

Past Actions - Past or historic mining operations within the study area include a few operations from the 1860s through the 1970s, as well as modern operations from the 1980s. It appears that essentially all of the historic mining operations within the study area occurred in the Eureka Mining District. The disturbance to vegetation is estimated to be approximately 200 acres. None of that disturbance was reclaimed. The more modern operations within the study area including the Gold Bar Mine and the Ruby Hill Mine, which together total approximately 1,343 acres of surface disturbance to vegetation. The Gold Bar Mine operated between the 1980s and 1990s and only a portion of the operation was reclaimed, which included the redistribution of stockpiled growth media and reestablishment of soil resources and vegetation. The Ruby Hill Mine began operations in the 1990s and is currently in operation. Portions of the mine have undergone

concurrent reclamation, including the redistribution of growth media and the reestablishment of soil resources. Other past actions that have affected vegetation include the development of roads, powerlines and other utilities, fences, development of cattle and wild horse water sources, livestock grazing, wild horse use, agricultural activities (both direct vegetation changes and changes to phreatophytic vegetation from water table drawdown), dispersed recreation, and land development and are estimated at 550 acres of surface disturbance. Impacts to vegetation from these activities include removal of vegetation, compaction, mixing, erosion of soils, and change in plant community structure and diversity. The extent of these impacts varies with the type of activity. The Bootstraps crew treated approximately 2,500 acres of piñon-juniper in the Willow and Vinini Creek drainages and in the Henderson Summit area in 2008 and 2009 under the Roberts Mountain Wildlife Habitat Enhancement Project EA completed in 2007.

Present Actions - Present actions include the ongoing Ruby Hill Mine, discussed above, as well as exploration activities under 153 notices and 22 plans of operations, which are estimated at 13,669 acres that are not otherwise included under the past actions. The Proposed Action would include 8,318 acres of surface disturbance to vegetation, as well as potential changes to phreatophytic vegetation and habitat for the Monte Neva Indian paintbrush from the water table drawdown. The Sulphur Springs Hazardous Fuels Reduction EA was completed in 2009 has been partially implemented. The EA allows for the removal/thinning of encroaching piñon-juniper from up to 3,000 acres of habitat containing healthy concentrations of bitterbrush. That part of the project has not yet been implemented. The BLM intends to initiate this project in 2011 with the Bootstraps crew, though most of the BLM's efforts would be focused on continuation of the Bald Mountain project initiated in 2010, if expected NRCS funding is approved. Other present actions that have an effect on vegetation are a continuation of those activities outlined under past actions. Impacts to vegetation from these activities include removal of vegetation and compaction, mixing, erosion of soils, and change in plant community structure and diversity. The extent of these impacts varies with the type of activity.

RFFAs - RFFAs within the study area could result in up to approximately 14,058 acres of surface disturbance that would affect vegetation. These activities include up to 1,147 acres of surface disturbance associated with mineral operations and 5,377 acres associated with land sales and their subsequent development. Impacts to vegetation from these activities include removal of vegetation and compaction, mixing, erosion of soils, and change in plant community structure and diversity. The extent of these impacts varies with the type of activity.

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other non-habitat restoration present actions and RFFAs (which total approximately 89,000 acres) would not be subject to reclamation requirements either because of their perpetual nature or lack of state or federal statutory requirements for reclamation. The CESA for vegetation covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Proposed Action would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit of the Proposed Action represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs. The vegetation communities within the CESA are similar to those within the Project Area and

common in the region. The cumulative and incremental effect of vegetation removal or modification would be below the level of significance.

The four special status plant species with potential habitat within the Project Area (Beatley buckwheat, least phacelia, Monte Neva Indian paintbrush, and windloving buckwheat) also have potential habitat within the CESA. None of these species has been documented as occurring within the CESA; however, no systematic survey has been completed. The cumulative effect and incremental loss of potential habitat for the four special status plant species resulting from past and present actions, proposed actions, and RFFAs would be below the level of significance.

4.4.8 Noxious Weeds, Invasive and Nonnative Species

Past Actions - Past or historic mining operations within the study area include a few operations from the 1860s through the 1970s, as well as modern operations from the 1980s. It appears that essentially all of the historic mining operations within the study area occurred in the Eureka Mining District. Surface disturbance creates an environment conducive to supporting noxious weeds and invasive, nonnative species. The disturbance to vegetation and potential impacts from noxious weeds and invasive, nonnative species is estimated to be approximately 200 acres. None of that disturbance was reclaimed. The more modern operations within the study area include the Gold Bar Mine and the Ruby Hill Mine, which together total approximately 1,343 acres of surface disturbance to vegetation and potential impacts from invasive, nonnative species and noxious weeds. The Gold Bar Mine operated between the 1980s and 1990s, and only a portion of the operation was reclaimed, which included the redistribution of stockpile growth media and the reestablishment of soil resources; however, approximately 11 acres of the old Ruby Hill mill site are currently infested with spotted knapweed, a NDOA Category A noxious weed. The Ruby Hill Mine began operations in the 1990s and is currently in operation. Portions of the mine have undergone concurrent reclamation, including the redistribution of growth media and the reestablishment of soil resources. Other past actions that have resulted in the removal of vegetation include the development of roads, powerlines and other utilities, fences, development of cattle and wild horse water sources, agricultural activities, dispersed recreation, noxious weed control efforts, and land development and are estimated at 550 acres of surface disturbance. Impacts from these activities include the increased potential to introduce noxious weeds and invasive, nonnative species or spread existing populations of noxious weeds and invasive, nonnative species. The extent of these impacts varies with the type of activity.

Present Actions - Present actions include the ongoing Ruby Hill Mine, discussed above, as well as exploration activities under 153 notices and 22 plans of operations, which are estimated at 13,669 acres that are not otherwise included under the past actions. The Proposed Action would include 8,318 acres of surface disturbance to vegetation and noxious weeds and invasive, nonnative species. Other present actions that have an effect on vegetation and noxious weeds and invasive, nonnative species are a continuation of those activities outlined under past actions. Impacts from these activities include the increased potential to introduce noxious weeds and invasive, nonnative species or spread existing populations of noxious weeds and invasive, nonnative species. The extent of these impacts varies with the type of activity.

RFFAs - RFFAs within the study area could result in up to approximately 14,058 acres of surface disturbance that would affect vegetation. These activities include up to 1,147 acres of surface disturbance associated with mineral operations and 5,377 acres associated with land sales

and their subsequent development. Impacts from these activities include the increased potential to introduce noxious weeds and invasive, nonnative species or spread existing populations of noxious weeds and invasive, nonnative species. The extent of these impacts vary with the type of activity.

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation, noxious weeds, and invasive, nonnative species. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements either because of their perpetual nature or lack of state or federal statutory requirements for reclamation. The CESA for noxious weeds and invasive, nonnative species covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Proposed Action would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit of the Proposed Action represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs.

An infestation of noxious weeds and invasive, nonnative species that starts in one project may expand to outside areas and increase the chance of the introduction of noxious weeds and invasive, nonnative species to other disturbed locations. The operational performance standards identified to reduce the potential impacts of the Proposed Action would help to control noxious weed establishment and spread within and adjacent to the Project Area; therefore, the cumulative and incremental effect of surface disturbance on noxious weed management would be below the level of significance.

4.4.9 Wetlands and Riparian Zones

Past Actions - Past or historic mining operations within the study area include a few operations from the 1860s through the 1970s, as well as modern operations from the 1980s. It appears that essentially all of the historic mining operations within the study area occurred in the Eureka Mining District. The disturbance to vegetation is estimated to be approximately 200 acres. None of that disturbance was reclaimed. The more modern operations within the study area include the Gold Bar Mine and the Ruby Hill Mine, which together total approximately 1,343 acres of surface disturbance to vegetation. The Gold Bar Mine operated between the 1980s and 1990s, and only a portion of the operation was reclaimed, which included the redistribution of stockpiled growth media and reestablishment of soil resources and vegetation. The Ruby Hill Mine began operations in the 1990s and is currently in operation. Portions of the mine have undergone concurrent reclamation, including the redistribution of growth media and the reestablishment of soil resources. Other past actions that have affected vegetation and wetlands and riparian zones include the development of roads, powerlines and other utilities, fences, development of cattle and wild horse water sources, livestock and wild horse use of water sources, agricultural activities (both direct disturbance of vegetation and indirect effects due to ground water pumping), dispersed recreation, and land development and are estimated at 550 acres of surface disturbance. Impacts to wetlands would likely be substantially less than this because most of the disturbance was removed from the drainage where the wetland and riparian vegetation communities occur. Specific impacts to wetlands and riparian zones from these activities included the diversion of flows for mining or agriculture, the pumping of ground water

that is the source for streams and springs, the filling of drainages with spoil material, the removal of vegetation, or water drawdown resulting from dewatering activities. The extent of these impacts varies with the type of activity, as well as the location and proximity to the wetland and riparian communities.

Present Actions - Present actions include the ongoing Ruby Hill Mine, discussed above, as well as exploration activities under 153 notices and 22 plans of operations, which are estimated at 13,669 acres that are not otherwise included under the past actions. The Proposed Action would include 8,318 acres of surface disturbance to vegetation and potential indirect effects to riparian and wetland vegetation. Other present actions that have an effect on wetlands and riparian zones are a continuation of those activities outlined under past actions. Impacts to wetlands would likely be substantially less than this because most of the disturbance was removed from the drainage where the wetland and riparian vegetation communities occur. Specific impacts to wetlands and riparian zones from these activities included the diversion of flows for mining or agriculture, the pumping of ground water that is the source for streams and springs, the filling of drainages with spoil material, the removal of vegetation, or water drawdown resulting from dewatering activities. The extent of these impacts varies with the type of activity. As discussed in Section 3.2, the water table drawdown resulting from the Proposed Action's mine dewatering system and ground water production systems is not expected to have a significant effect on riparian vegetation within the CESA.

RFFAs - RFFAs within the study area could result in up to approximately 14,058 acres of surface disturbance that would affect vegetation, which could affect wetland and riparian areas. These activities include up to 1,147 acres of surface disturbance associated with mineral operations and 5,377 acres associated with land sales and their subsequent development that could affect wetland and riparian areas. Impacts to wetlands would likely be substantially less than this because most of the disturbance was removed from the drainage where the wetland and riparian vegetation communities occur. Specific impacts to wetlands and riparian zones from these activities included the diversion of flows for mining or agriculture, the pumping of ground water that is the source for streams and springs, the filling of drainages with spoil material, the removal of vegetation, or water drawdown resulting from dewatering activities. The extent of these impacts varies with the type of activity.

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation; however, this disturbance is likely to occur in vegetation communities other than the wetland and riparian communities. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements either because of their perpetual nature or lack of state or federal statutory requirements for reclamation. The CESA for wetlands and riparian zones covers approximately 262,490 acres; therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Proposed Action would disturb approximately three percent of the CESA, which includes an indirect effect to approximately four acres of riparian vegetation community. The amount of area that would not be reclaimed (734 acres) associated with the open pit of the Proposed Action represents less than three percent of the total surface disturbance resulting from past, present, and RFFAs. The cumulative and incremental effect to wetlands and

riparian zones would be significant. Mitigation for the Proposed Action is outlined in Section 3.11.3.3.

4.4.10 Livestock Grazing and Production

Past Actions - Past or historic mining operations within the study area include a few operations from the 1860s through the 1970s, as well as modern operations from the 1980s. It appears that essentially all of the historic mining operations within the study area occurred in the Eureka Mining District. The disturbance to livestock grazing and production is estimated to be approximately 200 acres. None of that disturbance was reclaimed. The more modern operations within the study area include the Gold Bar Mine and the Ruby Hill Mine, which together total approximately 1,343 acres of surface disturbance to livestock grazing and production. The Gold Bar Mine operated between the 1980s and 1990s, and only a portion of the operation has been reclaimed, which included the redistribution of stockpiled growth media and reestablishment of soil resources and vegetation. The Ruby Hill Mine began operations in the 1990s and is currently in operation. Portions of the mine have undergone concurrent reclamation, including the redistribution of growth media and the reestablishment of soils. Other past actions that have affected livestock grazing and production include the development of roads, powerlines and other utilities, fences, development of cattle and wild horse water sources, agricultural activities, and land development and are estimated at 550 acres of surface disturbance. Impacts to livestock grazing and production from these activities include removal of vegetation (i.e., forage and cover for livestock) and compaction, mixing, erosion of soils, and change in plant community structure and diversity. The extent of these impacts varies with the type of activity.

Present Actions - Present actions within the CESA with the potential to impact livestock grazing and production include the following activities: irrigation of crops, which is estimated to occur on approximately 28,656 acres; habitat stabilization and rehabilitation activities on approximately 2,963 acres; wildland fires, fuels management, and reseeding projects on approximately 2,393 acres; minerals activities on approximately 3,040 acres; and the Proposed Action, which would include 8,318 acres of surface disturbance to livestock grazing and production and fencing that would enclose 14,204 acres, eliminating approximately 781 AUMs. Wild horse management affects livestock grazing and production as a result of gathers and adjustments to AMLs. Wild horse management can also affect the composition and productivity of the forage. Impacts to livestock grazing and production from these activities include removal of vegetation (i.e., forage and cover for livestock) and compaction, mixing, erosion of soils, and change in plant community structure and diversity. The extent of these impacts varies with the type of activity.

RFFAs - RFFAs within the CESA with the potential to impact livestock grazing and production include the following activities: wildland fires, fuels management, and reseeding projects on approximately 66,680 acres; habitat stabilization and rehabilitation activities on approximately 88,819 acres; minerals activities on approximately 275 acres; and 950 acres associated with land sales and their subsequent development. Impacts to livestock grazing and production from these activities include removal of vegetation (i.e., forage and cover for livestock) and compaction, mixing, erosion of soils, and change in plant community structure and diversity. The extent of these impacts varies with the type of activity. Other actions that could either positively or negatively affect livestock grazing and production include the 3 Bars Landscape Restoration Project, wild horse management activities, recreational uses, dewatering activities associated

with mining operations, ground water pumping associated with agricultural operations, and livestock uses.

Total past actions, present actions, and RFFAs would result in up to approximately 210,073 acres of surface disturbance in the CESA; however, approximately 90,339 acres of surface disturbance is, or would be, associated with habitat stabilization, rehabilitation, and rangeland improvements, which would result in positive impacts to livestock grazing and production in the CESA. The majority of the 210,073 acres would be reclaimed and available for livestock grazing after the completion of reclamation activities. Approximately 781 AUMs would be lost in the Project Area due to the exclosure as a result of the Project, which is six percent of the current active grazing preference.

4.4.11 Wild Horses

Past Actions - Mining activity, oil and gas production, geothermal development, gravel pit expansion, road building, fencing, wild horse gathers, OHV use, and wind generation are all activities, which can impact wild horse distribution and seasonal movement throughout and between HMAs. Impacts to wild horses from these activities include removal of vegetation (1,348 acres) and forage, increased traffic, and displacement or disturbance from loud and sudden noises. Additional impacts to wild horses from these activities include changes in use and distribution patterns within HMAs. The extent of these impacts varies with the type of activity. Each activity results in incremental restrictions on free roaming behavior and over time may influence utilization patterns, genetic interchange, and use of water sources. Fences which exclude wild horse use may be constructed to protect riparian areas from overuse, exclude study areas or seedings, or divide grazing allotments or pastures. These fences result in fragmentation of the HMA and habitat used by wild horses, and restricts use of the HMAs.

Present Actions - Present actions would include 14,204 acres of surface disturbance that would affect wild horses. Other present actions that have an effect on vegetation are a continuation of those other activities outlined under past actions. Impacts to wild horses from these activities include removal of vegetation and forage, increased traffic, and displacement or disturbance from loud and sudden noises. The extent of these impacts varies with the type of activity.

RFFAs - RFFAs within the study area could result in minerals activities on approximately 275 acres and 950 acres associated with land sales and their subsequent development. Impacts to wild horses from these activities include removal of vegetation and forage, increased traffic, and displacement or disturbance from loud and sudden noises. The extent of these impacts varies with the type of activity. Other actions that could either positively or negatively affect wild horses include the 3 Bars Landscape Restoration Project, wild horse management activities, recreational uses, dewatering activities associated with mining operations, ground water pumping associated with agricultural operations, and livestock uses.

Total past actions, present actions, and RFFAs would result in up to approximately 16,777 acres of surface disturbance that would affect wild horses. The majority of this disturbance is associated with mining operations and is subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not likely be subject to reclamation requirements either because of their perpetual nature or lack of state or federal statutory requirements for reclamation. The CESA for wild horses covers approximately

253,610 acres. Therefore, all actions within the CESA would affect approximately 6.6 percent of the vegetation within the CESA. The Proposed Action would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit of the Proposed Action represents less than five percent of the total surface disturbance resulting from past, present, and RFFAs. In addition, the Proposed Action may result in further fragmentation of the habitat used within these HMAs through construction of over 20 miles of pipeline, construction of additional powerline, additional access road and fences. The implementation of mitigation measures identified in Chapter 3 of this EIS limit the loss of habitat and water sources to wild horses in the Project Area by development of six water sources; therefore, the cumulative and incremental effects to wild horses would be below the level of significance.

4.4.12 Land Use

Past Actions - Past actions generally did not consider potential impacts to land use and access, unless those actions had an effect on private property, or rights granted by the federal government. However, past actions such as powerlines, fences, unpaved roads, SR 278, and the past mining operations at Mount Hope have had and continue to have some level of location-specific impact on land use and access.

Present Actions - The present actions are similar to the past actions and in most cases are continuations of the past actions. These actions also have a continuing location-specific effect on land use and access. The Proposed Action would restrict land use and access through and within the Project Area.

RFFAs - Land use impacts from RFFAs could include limited or restricted use or access through specific areas from mineral exploration, mining, or fencing. These impacts would tend to be localized near the activities.

The current uses of the public lands within the Project Area are similar to those within the CESA and common to the region. The cumulative and incremental effect of the permanent loss of public lands managed for multiple uses within the CESA would be below the level of significance; however, under the RFFA, of the sale of a major portion of the Project Area, land use and access through that portion of the Project Area would be substantially changed.

4.4.13 Recreation and Wilderness Study Area

Past Actions - Past or historic mining operations within the study area include a few operations from the 1860s through the 1970s, as well as modern operations from the 1980s. It appears that essentially all of the historic mining operations within the study area occurred in the Eureka Mining District. The disturbance is estimated to be approximately 200 acres. None of that disturbance was reclaimed. The more modern operations within the study area include the Gold Bar Mine and the Ruby Hill Mine, which together total approximately 1,343 acres of surface disturbance. The Gold Bar Mine operated between the 1980s and 1990s, and only a portion of the operation was reclaimed, which included the redistribution of stockpiled growth media and reestablishment of soil resources and vegetation. The Ruby Hill Mine began operations in the 1990s and is currently in operation. Portions of the mine have undergone concurrent reclamation, including the redistribution of growth media and the reestablishment of soil resources. Other past

actions that have affected recreation and wilderness include the development of roads, wildland fires and fuels management, powerlines and other utilities, fences, development of cattle and wild horse water sources, agricultural activities, and land development. The cumulative disturbance associated with these activities is estimated at 381,272 acres. Impacts to recreation and wilderness from these activities include restrictions on access, noise, alterations to the visual characteristics, loss or displacement of wildlife, and impacts to surface waters and fishing. The extent of these impacts vary with the type of activity. In addition, this disturbance and associated effects on the recreational characteristics and wilderness values was likely minimal due to the different social values of the times.

Present Actions - Present actions include the ongoing Ruby Hill Mine, discussed above, as well as exploration activities under 153 notices and 22 plans of operations. These are estimated at 13,669 acres that are not otherwise included under the past actions. The Proposed Action would include 8,364 acres of surface disturbance. The Proposed Action would restrict access to 14,204 acres in the Project Area for the duration of the Project (approximately 70 years) and 734 acres in the long term. Other present actions that have an effect on recreation and wilderness are a continuation of the activities outlined under past actions. Impacts to recreation and wilderness from these activities include restrictions on access, noise, alterations to the visual characteristics, loss or displacement of wildlife, and impacts to surface waters and fishing; all of which diminishes the overall quality of the recreational or wilderness experience. The extent of these impacts varies with the type of activity.

RFFAs - RFFAs within the study area could result in up to approximately 138,859 acres of surface disturbance that would affect recreation and wilderness. These activities include up to 44,094 acres of disturbance associated with habitat stabilization and rehabilitation, 85,900 acres associated with wildland fires, fuels management, and reseeding, 12,143 acres of surface disturbance associated with mineral operations, and 5,857 acres associated with land sales and their subsequent development. Impacts to recreation and wilderness from these activities include restrictions on access, noise, alterations to the visual characteristics, loss or displacement of wildlife, and impacts to surface waters and fishing; all of which diminishes the overall quality of the recreational or wilderness experience. The extent of these impacts varies with the type of activity.

Total past actions, present actions, and RFFAs would result in up to approximately 542,257 acres of surface disturbance that would affect recreation, as well as potential indirect effects to high use recreation locations associated with the Roberts Creek drainage. The CESA for recreation and wilderness covers approximately 1,970,179 acres; therefore, approximately 27 percent of the CESA would be impacted. The Roberts Mountain and Simpson Park WSAs are located within the CESA for recreation and wilderness. The only past action, present action, or RFFA that could be expected to effect the WSAs are wildland fires and livestock grazing and production. All other actions could not reasonably be expected to occur within the WSA. The present actions and RFFAs associated with mineral operations and other activities on BLM-administered lands are subject to reclamation requirements, which would restore areas for future use and minimize the long-term impacts. In addition, approximately 44,094 acres of surface disturbance is, or would be, associated with habitat stabilization and rehabilitation, which would result in positive impacts to recreation and wilderness in the CESA; therefore the quality of the area available for future recreational opportunities would be improved, and there would be, in the long term, no unmitigated loss of a unique recreational resource. During the time any one, or all, of the

activities is occurring there would be a reduction in the quality of the recreational or wilderness experience in portions of the CESA.

It is not known which activities, other than the Proposed Action, may result in restrictions to access of recreation areas, but very few restrictions are anticipated. The permanent access restriction as a result of the Proposed Action would account for only 0.04 percent of the CESA; therefore, the cumulative and incremental effect of the permanent access restriction from public lands managed for multiple uses within the CESA would be below the level of significance.

4.4.14 Auditory Resources

Past Actions - Past actions generally did not consider potential impacts to auditory resources; however, any potential impacts from past actions would not persist, since any impacts would have been short term in nature and would not carry forward to the present.

Present Actions - The present actions within the CESA, including the Proposed Action are outlined in Section 3.16.2.2 and include Proposed Action activities, ranching, and traffic on SR 278.

RFFAs - Auditory resource impacts from RFFAs could include noise generation from mineral exploration and traffic on paved and unpaved roads. These impacts would tend to be localized near their noise sources.

Each of the identified individual projects within the CESA, including the proposed mining operations, contributes noise to the natural environment. Since the Proposed Action is the principal and dominant noise generating activity within the CESA, the potential impacts are less than significant (Section 3.16.3.3), and any present actions and RFFAs would be dispersed throughout the CESA, none of the projects including the Proposed Action would result in a significant cumulative impact to the auditory resources.

4.4.15 Socioeconomic Values

Past Actions - Past or historic mining operations within the study area include a few operations from the 1860s through the 1970s, as well as modern operations from the 1980s. It appears that essentially all of the historic mining operations within the study area occurred in the Eureka Mining District. The more recent operations within the study area include the Gold Bar Mine and the Ruby Hill Mine. The Gold Bar Mine operated between the 1980s and 1990s and the Ruby Hill Mine began operations in the 1990s and is currently in operation. Other past actions that have affected socioeconomic values include the development of powerlines and other utilities, agricultural activities, recreation, and land development. Impacts to socioeconomic values from these activities include increased population, increased demand for public services, increased expenditures by Eureka County, increased employment opportunities, and increased revenues for Eureka County. The extent of these impacts vary with the type of activity and have not been quantified, however, the majority of the impacts from past activities do not have any ongoing impacts and are considered to be part of the existing social and economic climate within the CESA.

Present Actions - The present actions that would impact socioeconomic values include the following: mineral development and exploration; grazing and agriculture; recreation; oil, gas, and geothermal development; and land development. Impacts to socioeconomic values from these activities include increased population, increased demand for public services, increased expenditures by Eureka County, increased employment opportunities, and increased revenues for Eureka County. The extent of these impacts varies with the type of activity and have not been quantified. As discussed in Section 3.17, the Proposed Action would result in significant impacts by inducing substantial growth, causing a substantial net increase in county expenditures, and creating a substantial demand for public services and housing. In addition, county revenues, in the form of tax and net proceeds receipts, would have a corresponding increase.

RFFAs - Socioeconomic values impacts would result from the following RFFAs: mineral development and exploration; recreation; land development (including land sales); grazing and agriculture; and oil, gas, and geothermal development. The extent of the impacts from these actions would depend on the type and size of the project. Specific projects that are planned include a wind energy project, BLM land sales and the ensuing development of the lands, mineral development and exploration, and oil and gas leasing and development. These actions would tend to increase the significant cumulative impact to socioeconomic values.

The identified projects within the CESA, including the Proposed Action, would have both beneficial and potentially adverse impacts on social and economic values in Eureka County. However, the substantial economic growth and increase in tax revenues to Eureka County (and the State of Nevada) would likely outweigh any adverse effects leading to a net beneficial impact to the CESA. As stated in Section 3.17, EML has and would continue to coordinate with Eureka County to address these impacts and minimize the short-term fiscal impacts on the County.

4.4.16 Environmental Justice Effects

Initial analysis concluded that the potential effects of the Project would not be expected to disproportionately affect any particular population. Environmental effects that may occur at a greater distance, such as auditory resource or air impacts, would affect the area's population equally, without regard to nationality or income level. Since no disproportionate effects on an identified minority population results from the Proposed Action or the RFFAs, no further environmental justice analyses are required.

4.4.17 Hazardous Materials

Past Actions - Past actions generally did not consider potential impacts from hazardous materials; however, any potential impacts from past actions would not persist, since any uses of hazardous materials would have been limited in scope based on the past uses in the CESA and would likely not carry forward to the present.

Present Actions - The present actions within the CESA are outlined in Section 3.19.2.2 and include mining activities, ranching, and truck traffic on SR 278.

RFFAs - Hazardous materials impacts from RFFAs could include spills and leaks from mineral exploration and traffic on paved and unpaved roads. These impacts would tend to be localized near their sources.

The present actions and RFFAs within the CESA, including the proposed mining operations, contribute to potential hazardous materials effects to the natural environment. Since the Proposed Action is the principal hazardous materials generating activity within the CESA, its potential impacts are less than significant (Section 3.19.3.3), and any existing action and RFFAs such as traffic on SR 278 would be dispersed throughout the CESA, there would be no significant cumulative hazardous materials impact.

4.4.18 Historic Trails

The Historic Trail CESA is the viewshed from the Pony Express Trail for a distance of approximately three miles away from the trail. This area encompasses approximately 69,061 acres (Figure 3.20.1).

Past Actions - Past actions did not consider potential effects on the historic trail, primarily because the historic trail designation had not been created; however, these past actions, such as powerlines, fences, unpaved roads, SR 278, and past mining operations at Mount Hope have had and continue to have impacts on the visual setting for the historic trail. In addition, past mining operations were not subject to reclamation laws. These impacts are significant.

Present Actions - The present actions are similar to the past actions, except for the Project mining operations, and in most cases are a continuation of the past actions. These actions also have a continuing effect on the visual setting for the historic trail. As outlined in Section 3.20, the Proposed Action has a significant effect on the historic trail.

RFFAs - Historic trail impacts from RFFAs could include visual effects from mineral exploration and traffic on paved and unpaved roads. These impacts would tend to increase the significant cumulative impact to the historic trail. Additionally, direct effects to the historic trail could occur from these RFFAs.

The identified projects within the CESA, including the Proposed Action have an impact on the visual setting for the historic trail by adding visual elements that detract from the experience of those using the trail. These impacts are significant; however, the Proposed Action has design features that have been developed to lessen the impact. In addition, there is no mitigation that could reduce the impact to less than significant. In addition, under the RFFA a majority of the Project Area is identified as Category 1 in the RMP for disposal. Therefore, a sale of a major portion of the Project Area is assumed and access through that portion of the Project Area could be eliminated.

4.4.19 Cultural Resources

The area of cumulative analysis for cultural resources was defined in the PA to be the area in a 20-mile radius of Mount Hope, which covers an area of approximately 200,960 acres (Figure 3.7.1).

Past Actions – Most past actions did not consider potential effects on cultural resources. Projects and development disturbances conducted prior to 1966 (i.e., prior to NHPA) or those activities without a federal or state nexus generally did not identify or quantify cultural resource sites or impacts to them. These past actions, such as powerlines, fences, unpaved roads, SR 278, and

mining operations may have had a direct physical effect on cultural sites. These activities have had and continue to have impacts on the visual setting for cultural resources. These impacts are potentially significant.

Present Actions - The present actions are similar to the past actions, and in most cases is a continuation of the past actions. These actions also have a continuing effect on the visual setting for cultural resources.

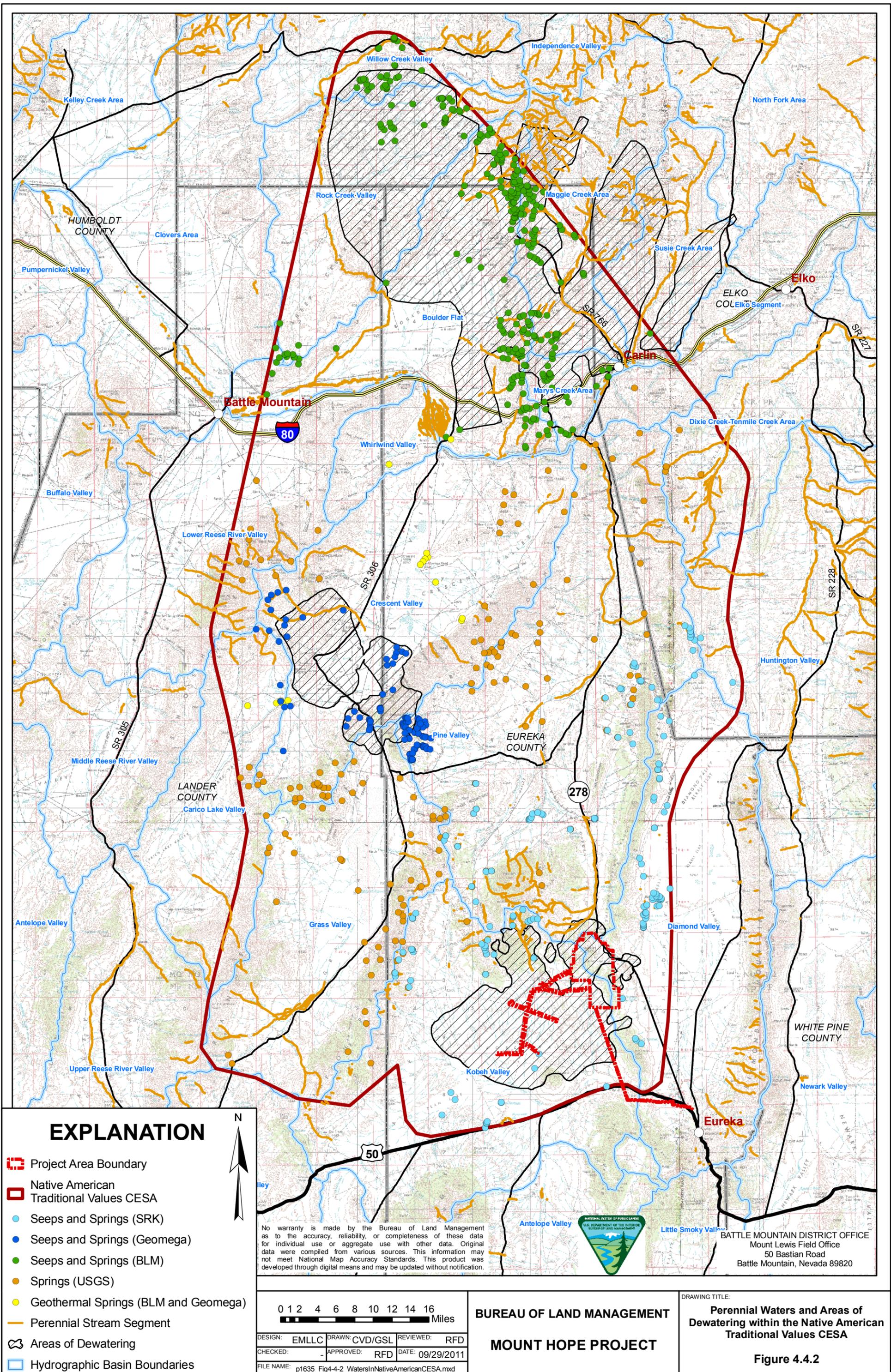
RFFAs - Cultural resource impacts from RFFAs could include indirect visual effects from mineral exploration and traffic on paved and unpaved roads. These impacts would tend to increase the significant cumulative impact to cultural resources. Additionally, direct effects to cultural resources from these are RFFAs could occur.

The identified projects within the CESA, including the Proposed Action have a direct physical impact on the cultural resources and an indirect impact on the visual setting for specific cultural resources that are potentially significant. Within the cumulative effects viewshed APE, a total of 436 eligible and unevaluated historic (361) and multi-component (75) sites with a historic component would be impacted. This number includes 152 officially eligible historic sites and 39 officially eligible multi-component sites with a historic element within the Project APE (Table 3.21-1). Impacts to these sites would be mitigated through the implementation of a treatment plan. Outside of the Project APE and within the viewshed APE, an additional 245 eligible or unevaluated historic and historic component sites may be adversely impacted. All adverse effects under the NHPA and direct and indirect impacts under NEPA to known-eligible properties identified within the Project APE would be mitigated in accordance with the PA and the treatment plan prepared for the Project. Any previously unknown-eligible properties that may be discovered during construction activities would be mitigated in accordance with the PA. Therefore, no additional mitigation or monitoring is proposed. No residual adverse effects are anticipated, as all known-eligible sites would be mitigated in accordance with the PA and the treatment plan prepared for the Project. Any previously unknown-eligible properties that may be discovered during construction activities would be mitigated in accordance with the PA.

4.4.20 Native American Traditional Values

Past Actions - Many past actions did not always consider potential effects on Native American Traditional Values, primarily because the management or consideration of this issue was not required. However, these past actions, such as powerlines, fences, unpaved roads, SR 278, wildland fires, and mining operations have resulted in the removal of piñon trees. The primary areas of past piñon tree removal include mining in the southern Roberts Mountains, northern Simpson Park Range and in the vicinity of Cortez, as well as wildland fires in the Cortez Range Commercial pine nut harvesting limits the amount of pine nuts that are available for Native American gathering in any given year. In addition, there are a number of projects that have resulted in the retrieval of prehistoric artifacts from public lands.

Present Actions - The present actions are similar to the past actions, except for mining operations, and in most cases are a continuation of the past actions. Present mining within the Native American CESA is focused in two areas; the Carlin Trend and the Cortez-Pipeline area. As shown on Figure 4.4.2, these two areas have ongoing dewatering operations that have the potential to affect a number of springs and perennial streams through decreased flows. The



EXPLANATION

- Project Area Boundary
- Native American Traditional Values CESA
- Seeps and Springs (SRK)
- Seeps and Springs (Geomega)
- Seeps and Springs (BLM)
- Springs (USGS)
- Geothermal Springs (BLM and Geomega)
- Perennial Stream Segment
- Areas of Dewatering
- Hydrographic Basin Boundaries



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.



BATTLE MOUNTAIN DISTRICT OFFICE
 Mount Lewis Field Office
 50 Bastian Road
 Battle Mountain, Nevada 89820



DESIGN: EMLLC	DRAWN: CVD/GSL	REVIEWED: RFD
CHECKED: _____	APPROVED: RFD	DATE: 09/29/2011
FILE NAME: p1635_Fig4-4-2_WatersInNativeAmericanCESA.mxd		

BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT

DRAWING TITLE:
Perennial Waters and Areas of Dewatering within the Native American Traditional Values CESA
Figure 4.4.2

present mining operations have had a limited effect on piñon trees (Figure 4.3.3). However, present mining operations have resulted in the retrieval of prehistoric artifacts from public and private lands.

RFFAs - Impacts to Native American Traditional Values from RFFAs could include the removal of additional piñon trees.

The identified projects within the CESA, including the Proposed Action have an impact on Native American Traditional Values, which include pine nut gathering and water resources. The Proposed Action would not result in the removal of any piñon-only woodlands. The Proposed Action's removal of piñon trees and limiting of access to other piñon trees in piñon-juniper woodlands within the fenced Project Area, relative to all other impacts to piñon trees, is not readily quantifiable. It is likely less than one percent of all the piñon trees within piñon-only and piñon-juniper woodlands within the CESA. In addition, the cumulative effect to piñon trees, relative to the total number of piñon trees within the Native American Traditional Values CESA is small (Figure 4.3.3) The Proposed Action's potential effect to water resources from ground water pumping, as shown on Figure 4.4.2, is isolated from the ground water pumping associated with the other mining operations within the Native American Traditional Values CESA. Figure 4.4.2 also shows the location of projects within the CESA where the removal or retrieval of prehistoric artifacts have occurred or may have occurred. Figure 4.4.2 does not show any potential effects from ground water pumping associated with agricultural operations. The Proposed Action's potential effects to water resources is incrementally a small percent of the total potential effect to water resources from all ground water pumping operations.

4.4.21 Wildlife and Fisheries Resources

Past Actions - Past or historic mining operations within the study area include a few operations from the 1860s through the 1970s, as well as modern operations from the 1980s. It appears that essentially all of the historic mining operations within the study area occurred in the Eureka Mining District. The disturbance to habitat for wildlife and fisheries resources is estimated to be approximately 200 acres. None of that disturbance was reclaimed. The more modern operations within the study area include the Gold Bar Mine and the Ruby Hill Mine, which together total approximately 1,343 acres of surface disturbance to wildlife and fisheries resources. The Gold Bar Mine operated between the 1980s and 1990s and only a portion of the operation was reclaimed, which included the redistribution of stockpiled growth media and reestablishment of soil resources and vegetation. The Ruby Hill Mine began operations in the 1990s and is currently in operation. Portions of the mine have undergone concurrent reclamation, including the redistribution of growth media and the reestablishment of soils. Other past actions that have affected wildlife and fisheries resources include the development of roads, powerlines and other utilities, agricultural operations, fences, development and use of cattle and wild horse water sources, agricultural activities, and land development, and are estimated at 550 acres of surface disturbance. Impacts to wildlife and fisheries resources from these activities are considered from a habitat and population perspective and include removal or modification of habitat, or loud and sudden noises that could result in displacement. A number of these past and present actions, such as roads, fences, agricultural development, may result in habitat fragmentation and migration route disruption, as well as affecting the success of reproduction. The extent of these impacts vary with the type of activity.

Past actions that may have affected the LCT recovery stream of Henderson Creek are livestock grazing and production, dispersed recreation, powerline development and maintenance, and mineral exploration. These actions continue to have the potential to degrade the habitat through siltation of the streams, the removal of vegetation adjacent to the stream, and a decrease in stream bank stability.

Present Actions - Present actions within the CESA with the potential to impact wildlife and fisheries resources include the following activities: grazing, agricultural, and forest products activities on 28,736 acres, utilities and infrastructure activities on 51,375 acres, oil and gas development on approximately 283 acres; habitat stabilization, rehabilitation, and wild horse management activities on approximately 3,248 acres; wildland fires, fuels management, and reseeded projects on approximately 283,270 acres; minerals activities on approximately 14,434 acres; mine hazardous/solid waste and mine hazardous materials on approximately 40 acres; the ongoing Ruby Hill Mine, discussed above; and the Proposed Action would include 8,318 acres of surface disturbance to wildlife and fisheries resources. Impacts to wildlife and fisheries resources from these activities are considered from a habitat and population perspective and include removal or modification of habitat, or loud and sudden noises that could result in displacement. The extent of these impacts varies with the type of activity.

Present actions that may have affected the LCT recovery stream of Henderson Creek and the sports fishery in Roberts Creek are grazing actions, wild horse, piñon-juniper encroachment, and dispersed recreation. The Proposed Action does not have any surface disturbance within the Pete Hansen Creek drainage. These actions have the potential to degrade the habitat through siltation of the streams, removal of vegetation adjacent to the stream, and a decrease in stream bank stability.

RFFAs - RFFAs within the CESA with the potential to impact wildlife and fisheries resources include the following activities: oil and gas development on approximately 573 acres; wildland fires, fuels management, and reseeded, forest products projects on approximately 85,900 acres; habitat stabilization, rehabilitation, and wild horse management activities on approximately 44,094 acres; minerals activities on approximately 1,147 acres; 5,857 acres associated with land sales and their subsequent development; and mine hazardous/solid waste on approximately 80 acres. Impacts to wildlife and fisheries resources from these activities are considered from a habitat and population perspective and include removal or modification of habitat or loud and sudden noises that could result in displacement. The extent of these impacts vary with the type of activity. Other actions that could either positively or negatively affect wildlife and fisheries include the 3 Bars Landscape Restoration Project, wild horse management activities, recreational uses, dewatering activities associated with mining operations, ground water pumping associated with agricultural operations, and livestock uses.

RFFAs that may have affected the LCT recovery stream of Henderson Creek is grazing action and dispersed recreation. These actions have the potential to degrade the habitat through siltation of the streams, removal of vegetation adjacent to the stream, and a decrease in stream bank stability.

Total past actions, present actions, and RFFAs would result in up to approximately 540,812 acres of habitat disturbance in the CESA; however, approximately 44,094 acres of habitat disturbance is, or would be, associated with habitat stabilization, rehabilitation, and rangeland improvements

that would result in positive impacts to wildlife and fisheries resources in the CESA. Significant cumulative impacts to the wildlife and fisheries habitat in the CESA would not be anticipated because the vast majority of land would be reclaimed. Even though none of the perennial drainages, including those that support sport fisheries, would appear to be affected hydrologically, there is a potential to affect stream flow through ground water pumping from the Proposed Action and thus affect the fisheries. Due to the widely dispersed nature of the existing and reasonably foreseeable individual mining projects within the CESA, cumulative noise and traffic impacts would not cause a substantial disturbance to wildlife populations or critically reduce use of their habitat.

Mitigation for impacts to wildlife resources is presently in Chapter 3 of this EIS and includes measures to protect greater sage-grouse, LCT, and migratory birds. Impacts to other wildlife and fisheries resources are below the level of significance.

4.4.22 Transportation and Access

Past Actions – The past actions that affected transportation and access center around actions that result in the movement of people and goods, as well as improvements to the transportation network itself. These actions include grazing activities, minerals development, land development and agricultural activities.

Present Actions – The present actions that affect transportations are essentially the same as those under the past actions. Section 3.24.2.2 outlines the current conditions associated with Transportation and access.

RFFAs - Transportation and access impacts from RFFAs could include limited or restricted use or access through specific areas from mineral exploration, mining, or fencing, or decreases in road quality. Transportation use would tend to be similar to those under the past and present actions. These impacts would tend to be localized near the activities.

The current access of the public lands within the Project Area are similar to those within the CESA and common to the region. The current transportation uses in the vicinity of the Project Area are similar to those with the CESA and common to the region. The cumulative and incremental effect of the permanent loss of public lands managed for multiple uses (734-acre area of the open pit) within the CESA would be below the level of significance; however, under the RFFA, of the sale of a major portion of the Project Area, access through that portion of the Project Area would be substantially changed.

4.4.23 Forest Products

Past Actions - Past or historic mining operations include a few operations from the 1860s through the 1970s. It appears that essentially all of the historic mining operations occurred in the Eureka Mining District. The direct disturbance to forest projects is estimated to be approximately 200 acres. None of that disturbance was reclaimed. In addition, most of the trees in the surrounding mountain ranges were cut to produce charcoal for the smelting operations. Other past actions that have affected forestry products include the development of roads, powerlines and other utilities, fences, development of cattle and wild horse water sources, dispersed recreation, and land development and are estimated at 550 acres of surface disturbance. Impacts

to forestry products from these activities include removal of vegetation, compaction, mixing, and erosion of soils. The extent of these impacts varies with the type of activity. The Bootstraps crew treated approximately 2,500 acres of piñon-juniper in the Willow and Vinini Creek drainages and in the Henderson Summit area in 2008 and 2009 under the Roberts Mountain Wildlife Habitat Enhancement Project EA completed in 2007.

Present Actions - Present actions include the ongoing Ruby Hill Mine, discussed above, as well as exploration activities under 153 notices and 22 plans of operations, which are estimated at 13,669 acres that are not otherwise included under the past actions. The Proposed Action would include 8,318 acres of surface disturbance to vegetation, a significant portion of which is piñon and juniper. Other present actions that have an effect on forest products are a continuation of those activities outlined under past actions. The extent of the impacts varies with the type of activity. The Sulphur Springs Hazardous Fuels Reduction EA that was completed in 2009 has been partially implemented. The EA allows for the removal/thinning of encroaching piñon-juniper from up to 3,000 acres of habitat containing healthy concentrations of bitterbrush. That part of the project has not yet been implemented. The BLM intends to initiate this project in 2011 with the Bootstraps crew, though most of the BLM's efforts would be focused on continuation of the Bald Mountain project initiated in 2010, if expected NRCS funding is approved.

RFFAs - RFFAs within the study area would be similar to those under the present actions. Impacts to forestry products from these activities include removal of vegetation and compaction, mixing, and erosion of soils. The extent of these impacts varies with the type of activity. Other actions that could either positively or negatively affect forest products include the 3 Bars Landscape Restoration Project, wild horse management activities, recreational uses, dewatering activities associated with mining operations, ground water pumping associated with agricultural operations, and livestock uses.

Total past actions, present actions, and RFFAs would result in up to approximately 28,309 acres of surface disturbance that would affect forest products. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for forest products covers approximately 515,000 acres. Therefore, all actions within the CESA would affect approximately five percent of the vegetation within the CESA. The Proposed Action would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit of the Proposed Action represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs. The vegetation communities within the CESA are similar to those within the Project Area and common in the region. The cumulative and incremental effect of vegetation removal or modification would be below the level of significance.

4.5 No Action Alternative Impact Analysis

The resources that may be cumulatively impacted by the No Action Alternative include air quality, soils, water resources, vegetation, wildlife, special status species, visual, socioeconomics, noxious weeds and invasive-nonnative species, cultural, and wild horses; however, the cumulative impacts under the No Action Alternative are minimal compared to any

of the action alternatives, including the Proposed Action. Activities under current authorizations would continue.

4.6 Partial Backfill Alternative Impact Analysis

The resources that may be cumulatively impacted by the Partial Backfill Alternative when combined with the past actions, present actions, and RFFAs include air quality, soils, water resources, vegetation, wildlife and fisheries, special status species, wetlands and riparian zones, livestock grazing and production, land use authorizations and access, visual, socioeconomics, geology and minerals, noxious weeds and invasive nonnative species, recreation and wilderness, historic trails, cultural resources, Native American Traditional Values, hazardous materials, and wild horses. The cumulative impacts under the Partial Backfill Alternative would be similar to the Proposed Action, due to similarity in size and scope of the operations under the alternative. The Partial Backfill Alternative would have a slightly greater incremental increase in cumulative impacts to some of the resources (air resources and hazardous materials) due to the use and combustion of the fuel as part of the backfill operation and would result in less long-term surface disturbance compared to the Proposed Action due to the additional reclamation in the bottom of the backfilled open pit and less impact to water quantity and quality due to no development of a pit lake.

Criteria for assessing the significance of potential impacts to the resources are the same as those presented in Chapter 3. A discussion of the past actions, present actions, and RFFAs for each resource is incorporated in to Section 4.4 and are applicable to each resource discussion under this section.

4.6.1 Water Resources - Water Quantity

Cumulative impacts to water resources within the study area are considered from surface water, ground water, and water quantity perspectives. Assessment of cumulative impacts from present actions and RFFAs that are developed would be incorporated into the periodic ground water flow model and pit lake chemistry model updates as specific activities and associated water resource impacts evolve and are quantified by data collection under the Integrated Monitoring Plan, as outlined in Section 2.1.16 of this EIS.

4.6.1.1 Surface Water Quantity

Cumulative activities indirectly affecting the surface water resources through the pumping of ground water was evaluated with ground water modeling of the cumulative actions that were modeled beyond 2200 (Montgomery et al. 2010). Figure 4.4.1 depicts the ten-foot drawdown contour for the cumulative actions scenario, at year 2055, using the Proposed Action. Based on the analysis of the Partial Backfill Alternation in Section 3.2 of this EIS, the cumulative actions scenario using the Partial Backfill Alternative would be similar to, and no greater than the analysis using the Proposed Action. This analysis identifies a number of springs and streams on the western flank of the Diamond Mountains, the northern end of Diamond Valley, in the Roberts Mountains and in Kobeh Valley that are within the ten-foot drawdown contour and thus their flows would be potentially diminished.

The cumulative impacts to surface water resources from the Proposed Action and RFFAs for ground water development would be significant. The Partial Backfill Alternative portion of the cumulative impacts is also considered significant and specific mitigation measures for the Partial Backfill Alternative effect are identified in Section 3.2.5.3. The cumulative actions, exclusive of the Partial Backfill Alternative, particularly the agricultural actions in Diamond Valley also have a significant effect on the surface water resources in Diamond Valley. No mitigation measures are proposed for these effects because the BLM does not have any regulatory authority over those actions.

4.6.1.2 Ground Water Quantity

Ground water modeling of the cumulative activities affecting the ground water resources was conducted through year 2055 (Montgomery et al. 2010). Figure 4.4.1 depicts the ten-foot drawdown contour for the cumulative actions scenario. This analysis identifies a number of wells in Diamond Valley and Kobeh Valley that are within the ten-foot drawdown contour and thus their flows would be potentially diminished.

The cumulative impacts to ground water resources from the Partial Backfill Alternative and RFFAs for ground water development would be significant. The Partial Backfill Alternative portion of the cumulative impacts is also considered significant and specific mitigation measures for the Partial Backfill Alternative effects are identified in Section 3.2.3.3. The cumulative actions, exclusive of the Partial Backfill Alternative, particularly the agricultural actions in Diamond Valley also have a significant effect on the ground water resources in Diamond Valley. No mitigation measures are proposed for these effects because the BLM does not have any regulatory authority over those actions.

4.6.2 **Water Resources - Water Quality**

Cumulative impacts to water resources within the study area are considered from surface water, ground water, and water quality perspectives. Assessment of cumulative impacts from present actions and RFFAs that are developed would be incorporated into the periodic ground water flow model and ground water chemistry model updates as specific activities and associated water resource impacts evolve and are quantified by data collection under the Integrated Monitoring Plan.

4.6.2.1 Surface Water Quality

The past, present, and RFFAs would potentially directly affect surface water resources through increased erosion and sedimentation. The mining-related cumulative actions would be required to implement erosion control measures that would limit their contribution to the cumulative impacts. Grazing has its own set of requirements that minimize effects to surface water quality. Dispersed recreation actions would not have the same requirements and thus would have a proportionally greater effect on surface water resources by removing vegetation and decreasing bank stability near streams and springs.

4.6.2.2 Ground Water Quality

Any potential cumulative impacts to ground water quality from the Partial Backfill Alternative, along with the past and present actions and the RFFAs for ground water would be significant, based on the criteria in Section 3.2, as a result of the backfilling of the open pit. The only two actions that have a quantitative assessment of potential ground water quality impacts are the Partial Backfill Alternative and the Ruby Hill Mine.

4.6.3 **Geology and Mineral Resources**

Mining disturbance has included open pit and underground operations with WRDFs, heap leach ore processing, ore milling and processing, tailings disposal, and exploration (drilling, trenching, sampling, and road construction). Past surface disturbance is 200 acres, the present and proposed disturbance is 14,434 acres, and approximately 1,147 acres of disturbance is anticipated under the RFFAs. This totals 15,581 acres of disturbance within the 1,809,522-acre CESA.

Mining is a major activity in the area, and it is likely that exploration activities and mining would continue. Additional impacts would result from the creation in the foreseeable future of additional open pit mining operations with WRDFs and processing facilities. The direct impacts affecting geology and mineral resources of the Partial Backfill Alternative due to the open pit mining would be the permanent removal of the identified mineral resources. The cumulative impacts to geology and mineral resources from the Partial Backfill Alternative and RFFAs for mineral development would not be significant. No mitigation is proposed.

4.6.4 **Air Resources**

Each of the identified individual projects within the CESA, including existing and proposed mining operations, emit air pollutants. With the possible exception of motor vehicle emissions, the existing and proposed mining operations are the major sources of criteria pollutants within the CESA. The modeling for the Proposed Action, which is representative of the Partial Backfill Alternative, as well as the Ruby Hill Mine, shows that the levels of these pollutants below the applicable standards. The Partial Backfill Alternative would not result in a significant cumulative impact to air resources. The RFFAs would result in additional emissions similar to those currently emitted by the existing operations within the CESA. In addition, the major sources of pollutants (except for motor vehicle emissions) within the CESA would operate under permit conditions established by the BAPC and therefore would not be significant.

4.6.5 **Visual Resources**

Mining disturbance has included open pit and underground operations with WRDFs, heap leach ore processing, ore milling and processing, tailings disposal, and exploration (drilling, trenching, sampling, and road construction). Past surface disturbance is 200 acres, the present and proposed disturbance is 12,714 acres, and approximately 1,147 acres of disturbance is anticipated under the RFFAs. Past and present actions, as well as RFFAs associated with agricultural actions have surface disturbance totaling approximately 29,496 acres. Past and present actions, as well as RFFAs associated with utilities and infrastructure actions have surface disturbance totaling approximately 51,823 acres. Past and present actions, as well as RFFAs associated with general development actions have surface disturbance totaling approximately 16,074 acres. These actions

total approximately 122,266 acres of disturbance within the approximately 645,000-acre CESA for visual resources.

There are many actions that have an effect on the visual resources within the vicinity of the Project Area. The BLM's visual management for the Project Area allows for substantial change to the visual characteristics of the area. Therefore, the cumulative impacts to visual resources from the Partial Backfill Alternative, along with the past and present actions and the RFFAs would not be significant; however, activities to minimize the visual effects are incorporated in the Project reclamation plan. In addition, VRM classes do not establish management direction and should not be used as a basis for constraining or limiting surface disturbing activities.

4.6.6 Soils

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect soil resources. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements either because of their perpetual nature or lack of state or federal statutory requirements for reclamation. The CESA for soil resources covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the soil resources within the CESA.

4.6.7 Vegetation Resources

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for vegetation covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Partial Backfill Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (207 acres) associated with the unbackfilled portion of the open pit of the Partial Backfill Alternative represents less than two percent of the total surface disturbance resulting from past, present, and RFFAs. The vegetation communities within the CESA are similar to those within the Project Area and common in the region. The cumulative and incremental effect of vegetation removal or modification would be below the level of significance.

The four special status plant species with potential habitat within the Project Area (Beatley buckwheat, least phacelia, Monte Neva Indian paintbrush, and windloving buckwheat) also have potential habitat within the CESA. None of these species has been documented as occurring within the CESA; however, no systematic survey has been completed. The cumulative effect and incremental loss of potential habitat for the four special status plant species resulting from past and present actions, proposed actions, and RFFAs would be below the level of significance.

4.6.8 Noxious Weeds, Invasive and Nonnative Species

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation, noxious weeds, and invasive, nonnative species. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for noxious weeds and invasive, nonnative species covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Partial Backfill Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (207 acres) associated with the unbackfilled portion of the open pit for the Partial Backfill Alternative represents less than two percent of the total surface disturbance resulting from past, present, and RFFAs.

An infestation of noxious weeds and invasive, nonnative species that starts in one project may expand to outside areas and increase the chance of the introduction of noxious weeds and invasive, nonnative species to other disturbed locations. The operational performance standards identified to reduce the potential impacts of the Partial Backfill alternative would help to control noxious weed establishment and spread within and adjacent to the Project Area; therefore, the cumulative and incremental effect of surface disturbance on noxious weed management would be below the level of significance.

4.6.9 Wetlands and Riparian Zones

Total past actions, present actions, and RFFAs would result in up to approximately 24,577 acres of surface disturbance that would affect vegetation; however, the disturbance is likely to occur in vegetation communities other than the riparian vegetation community. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements either because of their perpetual nature or lack of state or federal statutory requirements for reclamation. The CESA for wetlands and riparian zones covers approximately 262,490 acres; therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Partial Backfill Alternative would disturb approximately three percent of the CESA, which includes an indirect effect to approximately four acres of riparian vegetation community. The amount of area that would not be reclaimed (207 acres) associated with the unbackfilled portion of the open pit for the Partial Backfill Alternative represents less than two percent of the total surface disturbance resulting from past, present, and RFFAs. The cumulative and incremental effect to wetlands and riparian zones would be significant. Mitigation for this alternative is outlined in Section 3.11.3.5.

4.6.10 Livestock Grazing and Production

Total past actions, present actions, and RFFAs would result in up to approximately 210,073 acres of surface disturbance in the CESA; however, approximately 90,339 acres of surface disturbance is, or would be, associated with habitat stabilization, rehabilitation, and rangeland improvements, which would result in positive impacts to livestock grazing and production in the CESA. The

majority of the 210,073 acres would be reclaimed and available for livestock grazing after the completion of reclamation activities. Approximately 781 AUMs would be lost in the Project Area due to the enclosure, which is six percent of the current active grazing preference.

4.6.11 Wild Horses

Total past actions, present actions, and RFFAs would result in up to approximately 16,777 acres of surface disturbance that would affect wild horses. The majority of this disturbance is associated with mining operations and is subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for wild horses covers approximately 253,610 acres. Therefore, all actions within the CESA would affect approximately 6.6 percent of the vegetation within the CESA. The Partial Backfill Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (207 acres) associated with the unbackfilled portion of the open pit for the Partial Backfill Alternative represents less than two percent of the total surface disturbance resulting from past, present, and RFFAs. The implementation of mitigation measures identified in Chapter 3 of this EIS limit the loss of habitat and water sources to wild horses in the Project Area by development of six water sources; therefore, the cumulative and incremental effects to wild horses would be below the level of significance.

4.6.12 Land Use

The current uses of the public lands within the Project Area are similar to those within the CESA and common to the region. The cumulative and incremental effect of the permanent loss of public lands managed for multiple uses within the CESA would be below the level of significance; however, under the RFFA, of the sale of a major portion of the Project Area, land use and access through that portion of the Project Area would be substantially changed.

4.6.13 Recreation and Wilderness Study Area

Total past actions, present actions, and RFFAs would result in up to approximately 530,467 acres of surface disturbance that would affect recreation, as well as potential indirect effects to high use recreation locations associated with the Roberts Creek drainage. The CESA for recreation and wilderness covers approximately 1,970,179 acres; therefore, approximately 27 percent of the CESA would be impacted. The present actions and RFFAs associated with mineral operations and other activities on BLM-administered lands are subject to reclamation requirements, which would restore areas for future use and minimize the long-term impacts. In addition, approximately 444,094 acres of surface disturbance is, or would be, associated with habitat stabilization and rehabilitation, which would result in positive impacts to recreation and wilderness in the CESA; therefore the quality of the area available for future recreational opportunities would be improved, and there would be, in the long term, no unmitigated loss of a unique recreational resource. While any one, or all, of the activities is occurring there would be a reduction in the quality of the recreational or wilderness experience in portions of the CESA.

It is not known which activities, other than the Partial Backfill Alternative, may result in restrictions to access of recreation areas, but very few restrictions are anticipated. The permanent access restriction as a result of the Partial Backfill Alternative would account for only 0.04

percent of the CESA; therefore, the cumulative and incremental effect of the permanent access restriction from public lands managed for multiple uses within the CESA would be below the level of significance.

4.6.14 Auditory Resources

Each of the identified individual projects within the CESA, including the proposed mining operations, contributes noise to the natural environment. Since the Partial Backfill Alternative is the principal and dominant noise generating activity within the CESA, the potential impacts are less than significant (Section 3.16.3.3), and any present actions and RFFAs would be dispersed throughout the CESA, none of the projects, including the Partial Backfill Alternative would result in a significant cumulative impact to the auditory resources.

4.6.15 Socioeconomic Values

The identified projects within the CESA, including the Partial Backfill Alternative, would have a net beneficial impact on social and economic values in Eureka County. As stated in Section 3.17, EML has and would continue to coordinate with Eureka County to address these impacts and minimize the short-term fiscal impacts on the County.

4.6.16 Environmental Justice Effects

Initial analysis concluded that the potential effects of the Project would not be expected to disproportionately affect any particular population. Environmental effects that may occur at a greater distance, such as auditory resource or air impacts, would affect the area's population equally, without regard to nationality or income level. Since no disproportionate effects on an identified minority population results from the Partial Backfill Alternative or the RFFAs, no further environmental justice analyses are required.

4.6.17 Hazardous Materials

The present actions and RFFAs within the CESA, including the proposed mining operations, contribute to potential hazardous materials effects to the natural environment. Since the Proposed Action is the principal hazardous materials generating activity within the CESA, the potential impacts are less than significant (Section 3.19.3.3), and any existing action and RFFAs such as traffic on SR 278 would be dispersed throughout the CESA, there would be no significant cumulative hazardous materials impact.

4.6.18 Historic Trails

The identified projects within the CESA, including the Partial Backfill Alternative have an impact on the visual setting for the historic trail by adding visual elements that may detract from the experience of those using the trail. These impacts are significant; however, the impacts would be less than those under the Proposed Action since the Non-PAG WRDF would be removed and transported to the open pit. Even with these activities, the open pit highwall would remain visible from the trail. In addition, there is no mitigation that could reduce the impact to less than significant. In addition, under the RFFA of the sale of a major portion of the Project Area, access through that portion of the Project Area could be eliminated.

4.6.19 Cultural Resources

The identified projects within the CESA, including the Partial Backfill Alternative have a direct physical impact on the cultural resources and an indirect impact on the visual setting for specific cultural resources that are potentially significant. Within the cumulative effects viewshed APE, a total of 436 eligible and unevaluated historic (361) and multi-component (75) sites with a historic component would be visually impacted. This number includes 152 officially eligible historic sites and 39 officially eligible multi-component sites with a historic elements within the Project APE (Table 3.21-1). Impacts to those sites would be mitigated through the implementation of a treatment plan. Outside of the Project APE and within the viewshed APE, an additional 245 eligible or unevaluated historic and historic component sites may be adversely impacted. All adverse effects under the NHPA and direct and indirect impacts under NEPA to known-eligible properties identified within the Project APE would be mitigated in accordance with the PA and the treatment plan prepared for the Project. Any previously unknown-eligible properties that may be discovered during construction activities would be mitigated in accordance with the PA. Therefore, no additional mitigation or monitoring is proposed. No residual adverse effects are anticipated, as all known-eligible sites would be mitigated in accordance with the PA and the treatment plan prepared for the Project. Any previously unknown-eligible properties that may be discovered during construction activities would be mitigated in accordance with the PA.

4.6.20 Native American Traditional Values

The identified projects within the CESA, including the Partial Backfill Alternative have an impact on Native American Traditional Values, which include pine nut gathering and water resources. Although this alternative would not result in the removal of any piñon-only woodlands, the Partial Backfill Alternative's removal of piñon trees and limiting of access to other piñon trees in piñon-juniper woodlands within the fenced Project Area, relative to all other impacts to piñon trees, is not readily quantifiable; however, it is likely less than one percent of all the piñon trees within piñon-only and piñon-juniper woodlands in the CESA. In addition, the cumulative effect to piñon trees, relative to the total number of piñon trees within the Native American Traditional Values CESA is small (Figure 4.3.3) The Proposed Action's potential effect to water resources from ground water pumping, as shown on Figure 4.4.2, which is representative of the ground water pumping effects of the Partial Backfill Alternative, is isolated from the ground water pumping associated with the other mining operations within the Native American Traditional Values CESA. Figure 4.4.2 also shows the location of projects within the CESA where the removal or retrieval of prehistoric artifacts have occurred or may have occurred. Figure 4.4.2 does not show any potential effects from ground water pumping associated with agricultural operations. The Partial Backfill Alternative's potential effects to water resources is incrementally a small percent of the total potential effect to water resources from ground water pumping operations.

4.6.21 Wildlife and Fisheries Resources

Total past actions, present actions, and RFFAs would result in up to approximately 540,812 acres of habitat disturbance in the CESA; however, approximately 47,094 acres of habitat disturbance is, or would be, associated with habitat stabilization, rehabilitation, and rangeland improvements that would result in positive impacts to wildlife and fisheries resources in the CESA. Significant

cumulative impacts to the wildlife and fisheries habitat in the CESA would not be anticipated because the vast majority of land would be reclaimed. Even though none of the perennial drainages, including those that support sport fisheries, would appear to be affected hydrologically, there is a potential to affect stream flow through ground water pumping from the Partial Backfill Alternative and thus affect the fisheries. Due to the widely dispersed nature of the existing and reasonably foreseeable individual mining projects within the CESA, cumulative noise and traffic impacts would not cause a substantial disturbance to wildlife populations or critically reduce use of their habitat.

Mitigation for impacts to wildlife resources is presently in Chapter 3 of this EIS and includes measures to protect greater sage-grouse, LCT, and migratory birds. Impacts to other wildlife and fisheries resources are below the level of significance.

4.6.22 Transportation and Access

The current access of the public lands within the Project Area are similar to those within the CESA and common to the region. The current transportation uses in the vicinity of the Project Area are similar to those with the CESA and common to the region. The cumulative and incremental effect of the permanent loss of public lands managed for multiple uses (207-acre area of the non-backfilled highwall) within the CESA would be below the level of significance; however, under the RFFA, of the sale of a major portion of the Project Area, access through that portion of the Project Area would be substantially changed.

4.6.23 Forest Products

Total past actions, present actions, and RFFAs would result in up to approximately 28,309 acres of surface disturbance that would affect forest products. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for forest products covers approximately 515,000 acres. Therefore, all actions within the CESA would affect approximately five percent of the vegetation within the CESA. The Proposed Action would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (207 acres) associated with the unbackfilled portion of the open pit for the Partial Backfill Alternative represents less than two percent of the total surface disturbance resulting from past, present, and RFFAs. The vegetation communities within the CESA are similar to those within the Project Area and common in the region. The cumulative and incremental effect of vegetation removal or modification would be below the level of significance.

4.7 Off-Site Transfer of Ore Concentrate for Processing Alternative Impact Analysis

The resources which may be cumulatively impacted by the Off-Site Transfer of Ore Concentrate for Processing Alternative when combined with the past actions, present actions, and RFFAs include air quality, soils, water resources, vegetation, wildlife and fisheries, special status species, wetlands and riparian zones, livestock grazing and production, land use, transportation and access, visual, socioeconomics, geology and minerals, noxious weeds and invasive nonnative species, recreation and wilderness, historic trails, cultural resources, Native American

traditional concerns, hazardous materials, forestry products, and wild horses. The cumulative impacts under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be similar to the Proposed Action, due to similarity in size and scope of the operations under the alternative. The Off-Site Transfer of Ore Concentrate for Processing Alternative would have a lesser incremental increase in cumulative impacts to some other resources (socioeconomics and air resources) compared to the Proposed Action due to the processing of the concentrate outside of the air resources CESA and the reduced number of employees and economic activity.

4.7.1 Water Resources - Water Quantity

Cumulative impacts to water resources within the study area are considered from surface water, ground water, and water quantity perspectives. Assessment of cumulative impacts from present actions and RFFAs that are developed would be incorporated into the periodic ground water flow model and pit lake chemistry model updates as specific activities and associated water resource impacts evolve and are quantified by data collection under the Integrated Monitoring Plan, as outlined in Section 2.1.16 of this EIS.

4.7.1.1 Surface Water Quantity

Cumulative activities indirectly affecting the surface water resources through the pumping of ground water was evaluated with ground water modeling of the cumulative actions that were modeled beyond 2200 (Montgomery et al. 2010). Figure 4.4.1 depicts the ten-foot drawdown contour for the cumulative actions scenario, at year 2055, using the Proposed Action. Based on the analysis of the Off-Site Transfer of Ore Concentrate for Processing Alternation in Section 3.2 of this EIS, the cumulative actions scenario using the Off-Site Transfer of Ore Concentrate for Processing Alternative would be similar to, and no greater than the analysis using the Proposed Action. This analysis identifies a number of springs and streams on the western flank of the Diamond Mountains, the northern end of Diamond Valley, in the Roberts Mountains and in Kobeh Valley that are within the ten-foot drawdown contour and thus their flows would be potentially diminished.

The cumulative impacts to surface water resources from the Off-Site Transfer of Ore Concentrate for Processing Alternative and RFFAs for ground water development would be significant. The Off-Site Transfer of Ore Concentrate for Processing Alternative portion of the cumulative impacts is also considered significant and specific mitigation measures for the Off-Site Transfer of Ore Concentrate for Processing Alternative effect are identified in Section 3.2.5.3. The cumulative actions, exclusive of the Off-Site Transfer of Ore Concentrate for Processing Alternative, particularly the agricultural actions in Diamond Valley also have a significant effect on the surface water resources in Diamond Valley. No mitigation measures are proposed for these effects because the BLM does not have any regulatory authority over those actions.

4.7.1.2 Ground Water Quantity

Ground water modeling of the cumulative activities affecting the ground water resources was conducted through year 2055 (Montgomery et al. 2010). Figure 4.4.1 depicts the ten-foot drawdown contour for the cumulative actions scenario. This analysis identifies a number of wells

in Diamond Valley and Kobeh Valley that are within the ten-foot drawdown contour and thus their flows would be potentially diminished.

The cumulative impacts to ground water resources from the Off-Site Transfer of Ore Concentrate for Processing Alternative and RFFAs for ground water development would be significant. The Off-Site Transfer of Ore Concentrate for Processing Alternative portion of the cumulative impacts is also considered significant and specific mitigation measures for the Off-Site Transfer of Ore Concentrate for Processing Alternative effect are identified in Section 3.2.6.3. The cumulative actions, exclusive of the Off-Site Transfer of Ore Concentrate for Processing Alternative, particularly the agricultural actions in Diamond Valley also have a significant effect on the ground water resources in Diamond Valley. No mitigation measures are proposed for these effects because the BLM does not have any regulatory authority over those actions.

4.7.2 Water Resources - Water Quality

Cumulative impacts to water resources within the study area are considered from surface water, ground water, and water quality perspectives. Assessment of cumulative impacts from present actions and RFFAs that are developed would be incorporated into the periodic ground water flow model and ground water chemistry model updates as specific activities and associated water resource impacts evolve and are quantified by data collection under the Integrated Monitoring Plan.

4.7.2.1 Surface Water Quality

The past, present, and RFFAs would potentially directly affect surface water resources through increased erosion and sedimentation. The mining-related cumulative actions would be required to implement erosion control measures that would limit their contribution to the cumulative impacts. Grazing has its own set of requirements that minimize effects to surface water quality. Dispersed recreation actions would not have the same requirements and thus would have a proportionally greater affect on surface water resources by removing vegetation and decreasing bank stability near streams and springs.

4.7.2.2 Ground Water Quality

Any potential cumulative impacts to ground water quality from the Off-Site Transfer of Ore Concentrate for Processing Alternative, along with the past and present actions and the RFFAs for ground water would not be significant, based on the criteria in Section 3.2. The only two actions that have a quantitative assessment of potential ground water quality impacts are the Off-Site Transfer of Ore Concentrate for Processing Alternative and the Ruby Hill Mine.

4.7.3 Geology and Mineral Resources

Mining disturbance has included open pit and underground operations with WRDFs, heap leach ore processing, ore milling and processing, tailings disposal, and exploration (drilling, trenching, sampling, and road construction). Past surface disturbance is 200 acres, the present and proposed disturbance is 14,434 acres, and approximately 1,147 acres of disturbance is anticipated under the RFFAs. This totals 15,581 acres of disturbance within the 1,809,522-acre CESA.

Mining is a major activity in the area, and it is likely that exploration activities and mining would continue. Additional impacts would result from the creation in the foreseeable future of additional open pit mining operations with WRDFs and processing facilities. The direct impacts affecting geology and mineral resources of the Off-Site Transfer of Ore Concentrate for Processing Alternative due to the open pit mining would be the permanent removal of the identified mineral resources. The cumulative impacts to geology and mineral resources from the Off-Site Transfer of Ore Concentrate for Processing Alternative and RFFAs for mineral development would be significant. No mitigation is proposed.

4.7.4 Air Resources

Each of the identified individual projects within the CESA, including existing and proposed mining operations, emit air pollutants. With the possible exception of motor vehicle emissions, the existing and proposed mining operations are the major sources of criteria pollutants within the CESA. The modeling for the Proposed Action, which is representative of the Off-Site Transfer of Ore Concentrate for Processing Alternative, as well as the Ruby Hill Mine, shows that the levels of these pollutants below the applicable standards. The Off-Site Transfer of Ore Concentrate for Processing Alternative would not result in a significant cumulative impact to air resources. The RFFAs would result in additional emissions similar to those currently emitted by the existing operations within the CESA. In addition, the major sources of pollutants (except for motor vehicle emissions) within the CESA would operate under permit conditions established by the BAPC and therefore would not be significant.

4.7.5 Visual Resources

Mining disturbance has included open pit and underground operations with WRDFs, heap leach ore processing, ore milling and processing, tailings disposal, and exploration (drilling, trenching, sampling, and road construction). Past surface disturbance is 200 acres, the present and proposed disturbance is 12,714 acres, and approximately 1,147 acres of disturbance is anticipated under the RFFAs. Past and present actions, as well as RFFAs associated with agricultural actions have surface disturbance totaling approximately 29,496 acres. Past and present actions, as well as RFFAs associated with utilities and infrastructure actions have surface disturbance totaling approximately 51,823 acres. Past and present actions, as well as RFFAs associated with general development actions have surface disturbance totaling approximately 16,074 acres. These actions total approximately 122,266 acres of disturbance within the approximately 645,000-acre CESA for visual resources.

There are many actions that have an effect on the visual resources within the vicinity of the Project Area. The BLM's visual management for the Project Area allows for substantial change to the visual characteristics of the area. Therefore, the cumulative impacts to visual resources from the Off-Site Transfer of Ore Concentrate for Processing Alternative, along with the past and present actions and the RFFAs would not be significant; however, activities to minimize the visual effects are incorporated in the Project reclamation plan. In addition, VRM classes do not establish management direction and should not be used as a basis for constraining or limiting surface disturbing activities.

4.7.6 Soils

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect soil resources. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for soil resources covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the soil resources within the CESA.

4.7.7 Vegetation Resources

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for vegetation covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Off-Site Transfer of Ore Concentrate for Processing Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit of the Off-Site Transfer of Ore Concentrate for Processing Alternative represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs. The vegetation communities within the CESA are similar to those within the Project Area and common in the region. The cumulative and incremental effect of vegetation removal or modification would be below the level of significance.

The four special status plant species with potential habitat within the Project Area (Beatley buckwheat, least phacelia, Monte Neva Indian paintbrush, and windloving buckwheat) also have potential habitat within the CESA. None of these species has been documented as occurring within the CESA; however, no systematic survey has been completed. The cumulative effect and incremental loss of potential habitat for the four special status plant species resulting from past and present actions, proposed actions, and RFFAs would be below the level of significance.

4.7.8 Noxious Weeds, Invasive and Nonnative Species

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation, noxious weeds, and invasive, nonnative species. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for noxious weeds and invasive, nonnative species covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Off-Site Transfer of Ore Concentrate for Processing Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit for the

Off-Site Transfer of Ore Concentrate for Processing Alternative represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs.

An infestation of noxious weeds and invasive, nonnative species that starts in one project may expand to outside areas and increase the chance of the introduction of noxious weeds and invasive, nonnative species to other disturbed locations. The operational performance standards identified to reduce the potential impacts of the Off-Site Transfer of Ore Concentrate for Processing Alternative would help to control noxious weed establishment and spread within and adjacent to the Project Area; therefore, the cumulative and incremental effect of surface disturbance on noxious weed management would be below the level of significance.

4.7.9 Wetlands and Riparian Zones

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation; however, this disturbance is likely to occur in vegetation communities other than the riparian community. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for wetlands and riparian zones covers approximately 262,490 acres; therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA, which includes an indirect affect to approximately four acres of riparian vegetation community. The Off-Site Transfer of Ore Concentrate for Processing Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit for the Off-Site Transfer of Ore Concentrate for Processing Alternative represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs. The cumulative and incremental effect to wetlands and riparian zones would be significant.

4.7.10 Livestock Grazing and Production

Total past actions, present actions, and RFFAs would result in up to approximately 210,073 acres of surface disturbance in the CESA; however, approximately 90,339 acres of surface disturbance is, or would be, associated with habitat stabilization, rehabilitation, and rangeland improvements, which would result in positive impacts to livestock grazing and production in the CESA. The majority of the 210,073 acres would be reclaimed and available for livestock grazing after the completion of reclamation activities. Approximately 781 AUMs would be lost in the Project Area due to the enclosure which is six percent of the current active grazing preference.

4.7.11 Wild Horses

Total past actions, present actions, and RFFAs would result in up to approximately 16,777 acres of surface disturbance that would affect wild horses. The majority of this disturbance is associated with mining operations and is subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for wild horses covers approximately 253,610 acres. Therefore, all actions within the CESA would affect approximately 6.6 percent of the vegetation within the CESA. The Off-Site Transfer of Ore Concentrate for Processing Alternative would

disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit for the Off-Site Transfer of Ore Concentrate for Processing Alternative represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs. The implementation of mitigation measures identified in Chapter 3 of this EIS limit the loss of habitat and water sources to wild horses in the Project Area by development of six water sources; therefore, the cumulative and incremental effects to wild horses would be below the level of significance.

4.7.12 Land Use

The current uses of the public lands within the Project Area are similar to those within the CESA and common to the region. The cumulative and incremental effect of the permanent loss of public lands managed for multiple uses within the CESA would be below the level of significance; however, under the RFFA, of the sale of a major portion of the Project Area, land use and access through that portion of the Project Area would be substantially changed.

4.7.13 Recreation and Wilderness Study Area

Total past actions, present actions, and RFFAs would result in up to approximately 530,467 acres of surface disturbance that would affect recreation, as well as potential indirect effects to high use recreation locations associated with the Roberts Creek drainage. The CESA for recreation and wilderness covers approximately 1,970,179 acres; therefore, approximately 27 percent of the CESA would be impacted. The present actions and RFFAs associated with mineral operations and other activities on BLM-administered lands are subject to reclamation requirements, which would restore areas for future use and minimize the long-term impacts. In addition, approximately 444,094 acres of surface disturbance is, or would be, associated with habitat stabilization and rehabilitation, which would result in positive impacts to recreation and wilderness in the CESA; therefore the quality of the area available for future recreational opportunities would be improved, and there would be no unmitigated loss of a unique recreational resource. While any one, or all, of the activities occurs there would be a reduction in the quality of the recreational or wilderness experience in portions of the CESA.

It is not known which activities, other than the Off-Site Transfer of Ore Concentrate for Processing Alternative, may result in restrictions to access of recreation areas, but very few restrictions are anticipated. The permanent access restriction as a result of the Off-Site Transfer of Ore Concentrate for Processing Alternative would account for only 0.04 percent of the CESA; therefore, the cumulative and incremental effect of the permanent access restriction from public lands managed for multiple uses within the CESA would be below the level of significance.

4.7.14 Auditory Resources

Each of the identified individual projects within the CESA, including the proposed mining operations, contributes noise to the natural environment. Since the Off-Site Transfer of Ore Concentrate for Processing Alternative is the principal and dominant noise generating activity within the CESA, the potential impacts are less than significant (Section 3.16.3.3), and any present actions and RFFAs would be dispersed throughout the CESA, none of the projects including the Off-Site Transfer of Ore Concentrate for Processing Alternative would result in a significant cumulative impact to the auditory resources.

4.7.15 Socioeconomic Values

The identified projects within the CESA, including the Off-Site Transfer of Ore Concentrate for Processing Alternative, would have a net beneficial impact on social and economic values in Eureka County. As stated in Section 3.17, EML has and would continue to coordinate with Eureka County to address these impacts and minimize the short-term fiscal impacts on the County.

4.7.16 Environmental Justice Effects

Initial analysis concluded that the potential effects of the Project would not be expected to disproportionately affect any particular population. Environmental effects that may occur at a greater distance, such as auditory resource or air impacts, would affect the area's population equally, without regard to nationality or income level. Since no disproportionate effects on an identified minority population results from the Off-Site Transfer of Ore Concentrate for Processing Alternative or the RFFAs, no further environmental justice analyses are required.

4.7.17 Hazardous Materials

The present actions and RFFAs within the CESA, including the proposed mining operations, contribute to potential hazardous materials effects to the natural environment. Since the Proposed Action is the principal hazardous materials generating activity within the CESA, the potential impacts are less than significant (Section 3.19.3.3), and any existing action and RFFAs such as traffic on SR 278 would be dispersed throughout the CESA, there would be no significant cumulative hazardous materials impact.

4.7.18 Historic Trails

The identified projects within the CESA, including the Off-Site Transfer of Ore Concentrate for Processing Alternative have an impact on the visual setting for the historic trail by adding visual elements that may detract from the experience of those using the trail. These impacts are significant. In addition, there is no mitigation that could reduce the impact to less than significant. In addition, under the RFFA of the sale of a major portion of the Project Area, access through that portion of the Project Area could be eliminated.

4.7.19 Cultural Resources

The identified projects within the CESA, including the Off-Site Transfer of Ore Concentrate for Processing Alternative have a direct physical impact on the cultural resources and an indirect impact on the visual setting for specific cultural resources that are potentially significant. Within the cumulative effects viewshed APE, a total of 436 eligible and unevaluated historic (361) and multi-component (75) sites with a historic component would be visually impacted. This number includes 152 officially eligible historic sites and 39 officially eligible multi-component sites with a historic element within the Project APE (Table 3.21-1). Impacts to these sites would be mitigated through the implementation of a treatment plan. Outside of the Project APE and within the viewshed APE, an additional 245 eligible or unevaluated historic and historic component sites may be adversely impacted. All adverse effects under the NHPA and direct and indirect impacts under NEPA to known-eligible properties identified within the Project APE would be

mitigated in accordance with the PA and the treatment plan prepared for the Project. Any previously unknown-eligible properties that may be discovered during construction activities would be mitigated in accordance with the PA. Therefore, no additional mitigation or monitoring is proposed. No residual adverse effects are anticipated, as all known-eligible sites would be mitigated in accordance with the PA and the treatment plan prepared for the Project. Any previously unknown-eligible properties that may be discovered during construction activities would be mitigated in accordance with the PA.

4.7.20 Native American Traditional Values

The identified projects within the CESA, including the Off-Site Transfer of Ore Concentrate for Processing Alternative have an impact on Native American Traditional Values, which include pine nut gathering and water resources. Although this alternative would not result in the removal of any piñon-only woodlands, the Off-Site Transfer of Ore Concentrate for Processing Alternative's removal of piñon trees and limiting of access to other piñon trees in piñon-juniper woodlands within the fenced Project Area, relative to all other impacts to piñon trees, is not readily quantifiable; however, it is likely less than one percent of all the piñon trees within piñon-only and piñon-juniper woodlands in the CESA. In addition, the cumulative effect to piñon trees, relative to the total number of piñon trees within the Native American Traditional Values CESA is small (Figure 4.3.3) The Proposed Action's potential effect to water resources from ground water pumping, as shown on Figure 4.4.2, which is representative of the ground water pumping effects of the Off-Site Transfer of Ore Concentrate for Processing Alternative, is isolated from the ground water pumping associated with the other mining operations within the Native American Traditional Values CESA. Figure 4.4.2 also shows the location of projects within the CESA where the removal or retrieval of prehistoric artifacts have occurred or may have occurred. Figure 4.4.2 does not show any potential effects from ground water pumping associated with agricultural operations. The Off-Site Transfer of Ore Concentrate for Processing Alternative's potential effects to water resources is incrementally a small percent of the total potential effect to water resources from ground water pumping operations.

4.7.21 Wildlife and Fisheries Resources

Total past actions, present actions, and RFFAs would result in up to approximately 540,812 acres of habitat disturbance in the CESA; however, approximately 47,094 acres of habitat disturbance is, or would be, associated with habitat stabilization, rehabilitation, and rangeland improvements that would result in positive impacts to wildlife and fisheries resources in the CESA. Significant cumulative impacts to the wildlife and fisheries habitat in the CESA would not be anticipated because the vast majority of land would be reclaimed. Even though none of the perennial drainages, including those that support sport fisheries, would appear to be affected hydrologically, there is a potential to affect stream flow through ground water pumping from the Off-Site Transfer of Ore Concentrate for Processing Alternative and thus affect the fisheries. Due to the widely dispersed nature of the existing and reasonably foreseeable individual mining projects within the CESA, cumulative noise and traffic impacts would not cause a substantial disturbance to wildlife populations or critically reduce use of their habitat.

Mitigation for impacts to wildlife resources is presently in Chapter 3 of this EIS and includes measures to protect greater sage-grouse, LCT, and migratory birds. Impacts to other wildlife and fisheries resources are below the level of significance.

4.7.22 Transportation and Access

The current access of the public lands within the Project Area are similar to those within the CESA and common to the region. The current transportation uses in the vicinity of the Project Area are similar to those with the CESA and common to the region. The cumulative and incremental effect of the permanent loss of public lands managed for multiple uses (734-acre area of the open pit) within the CESA would be below the level of significance; however, under the RFFA, of the sale of a major portion of the Project Area, access through that portion of the Project Area would be substantially changed.

4.7.23 Forest Products

Total past actions, present actions, and RFFAs would result in up to approximately 28,309 acres of surface disturbance that would affect forest products. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for forest products covers approximately 515,000 acres. Therefore, all actions within the CESA would affect approximately five percent of the vegetation within the CESA. The Proposed Action would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit for the Off-Site Transfer of Ore Concentrate for Processing Alternative represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs. The vegetation communities within the CESA are similar to those within the Project Area and common in the region. The cumulative and incremental effect of vegetation removal or modification would be below the level of significance.

4.8 Slower, Longer Project Alternative Impact Analysis

The resources that may be cumulatively impacted by the Slower, Longer Project Alternative when combined with the past actions, present actions, and RFFAs include air quality, soils, water, vegetation, wildlife and fisheries, special status species, wetlands and riparian zones, livestock grazing and production, land use authorizations and access, visual, socioeconomics, geology and minerals, noxious weeds and invasive nonnative species, recreation and wilderness, historic trails, cultural resources, Native American Traditional Values, hazardous materials, and wild horses. The cumulative impacts under the Slower, Longer Project Alternative would be similar to the Proposed Action, due to similarity in size and scope of the operations under the alternative. The Slower, Longer Project Alternative would have a lesser incremental increase in cumulative impacts to some other resources (socioeconomics and air resources) compared to the Proposed Action due to the extended time frame over which this alternative would occur.

4.8.1 Water Resources - Water Quantity

Cumulative impacts to water resources within the study area are considered from surface water, ground water, and water quantity perspectives. Assessment of cumulative impacts from present actions and RFFAs that are developed would be incorporated into the periodic ground water flow model and pit lake chemistry model updates as specific activities and associated water resource

impacts evolve and are quantified by data collection under the Integrated Monitoring Plan, as outlined in Section 2.1.16 of this EIS.

4.8.1.1 Surface Water Quantity

Cumulative activities indirectly affecting the surface water resources through the pumping of ground water was evaluated with ground water modeling of the cumulative actions that were modeled beyond 2200 (Montgomery et al. 2010). Figure 4.4.1 depicts the ten-foot drawdown contour for the cumulative actions scenario, at year 2055, using the Proposed Action. Based on the analysis of the Slower, Longer Project Alternation in Section 3.2 of this EIS, the cumulative actions scenario using the Slower, Longer Project Alternative would be similar to, and possibly greater than the analysis using the Proposed Action. This analysis identifies a number of springs and streams on the western flank of the Diamond Mountains, the northern end of Diamond Valley, in the Roberts Mountains and in Kobeh Valley that are within the ten-foot drawdown contour and thus their flows would be potentially diminished.

The cumulative impacts to surface water resources from the Slower, Longer Project Alternative and RFFAs for ground water development would be significant. The Slower, Longer Project Alternative portion of the cumulative impacts is also considered significant and specific mitigation measures for the Slower, Longer Project Alternative effect are identified in Section 3.2.7.3. The cumulative actions, exclusive of the Slower, Longer Project Alternative, particularly the agricultural actions in Diamond Valley also have a significant effect on the surface water resources in Diamond Valley. No mitigation measures are proposed for these effects because the BLM does not have any regulatory authority over those actions.

4.8.1.2 Ground Water Quantity

Ground water modeling of the cumulative activities affecting the ground water resources was conducted through year 2055 (Montgomery et al. 2010). Figure 4.4.1 depicts the ten-foot drawdown contour for the cumulative actions scenario. This analysis identifies a number of wells in Diamond Valley and Kobeh Valley that are within the ten-foot drawdown contour and thus their flows would be potentially diminished.

The cumulative impacts to ground water resources from the Slower, Longer Project Alternative and RFFAs for ground water development would be significant. Slower, Longer Project Alternative portion of the cumulative impacts is also considered significant and specific mitigation measures for the Slower, Longer Project Alternative effect are identified in Section 3.2.6.3. The cumulative actions, exclusive of the Slower, Longer Project Alternative, particularly the agricultural actions in Diamond Valley also have a significant effect on the ground water resources in Diamond Valley. No mitigation measures are proposed for these effects because the BLM does not have any regulatory authority over those actions.

4.8.2 Water Resources - Water Quality

Cumulative impacts to water resources within the study area are considered from surface water, ground water, and water quality perspectives. Assessment of cumulative impacts from present actions and RFFAs that are developed would be incorporated into the periodic ground water flow model and ground water chemistry model updates as specific activities and associated water

resource impacts evolve and are quantified by data collection under the Integrated Monitoring Plan.

4.8.2.1 Surface Water Quality

The past, present, and RFFAs would potentially directly affect surface water resources through increased erosion and sedimentation. The mining-related cumulative actions would be required to implement erosion control measures that would limit their contribution to the cumulative impacts. Grazing has its own set of requirements that minimize effects to surface water quality. Dispersed recreation actions would not have the same requirements and thus would have a proportionally greater affect on surface water resources by removing vegetation and decreasing bank stability near streams and springs.

4.8.2.2 Ground Water Quality

Any potential cumulative impacts to ground water quality from the Slower, Longer Project Alternative, along with the past and present actions and the RFFAs for ground water would not be significant, based on the criteria in Section 3.2. The only two actions that have a quantitative assessment of potential ground water quality impacts are the Slower, Longer Project Alternative and the Ruby Hill Mine.

4.8.3 Geology and Mineral Resources

Mining disturbance has included open pit and underground operations with WRDFs, heap leach ore processing, ore milling and processing, tailings disposal, and exploration (drilling, trenching, sampling, and road construction). Past surface disturbance is 200 acres, the present and proposed disturbance is 14,434 acres, and approximately 1,147 acres of disturbance is anticipated under the RFFAs. This totals 15,581 acres of disturbance within the 1,809,522-acre CESA.

Mining is a major activity in the area, and it is likely that exploration activities and mining would continue. Additional impacts would result from the creation in the foreseeable future of additional open pit mining operations with WRDFs and processing facilities. The direct impacts affecting geology and mineral resources of the Slower, Longer Project Alternative due to the open pit mining would be the permanent removal of the identified mineral resources. The cumulative impacts to geology and mineral resources from the Slower, Longer Project Alternative and RFFAs for mineral development would not be significant. No mitigation is proposed.

4.8.4 Air Resources

Each of the identified individual projects within the CESA, including existing and proposed mining operations, emit air pollutants. With the possible exception of motor vehicle emissions, the existing and proposed mining operations are the major sources of criteria pollutants within the CESA. The modeling for the Proposed Action, which is representative of the Slower, Longer Project Alternative, as well as the Ruby Hill Mine, shows that the levels of these pollutants below the applicable standards. The Slower, Longer Project Alternative would not result in a significant cumulative impact to air resources. The RFFAs would result in additional emissions similar to those currently emitted by the existing operations within the CESA. In addition, the

major sources of pollutants (except for motor vehicle emissions) within the CESA would operate under permit conditions established by the BAPC and therefore would not be significant.

4.8.5 Visual Resources

Mining disturbance has included open pit and underground operations with WRDFs, heap leach ore processing, ore milling and processing, tailings disposal, and exploration (drilling, trenching, sampling, and road construction). Past surface disturbance is 200 acres, the present and proposed disturbance is 12,714 acres, and approximately 1,147 acres of disturbance is anticipated under the RFFAs. Past and present actions, as well as RFFAs associated with agricultural actions have surface disturbance totaling approximately 29,496 acres. Past and present actions, as well as RFFAs associated with utilities and infrastructure actions have surface disturbance totaling approximately 51,823 acres. Past and present actions, as well as RFFAs associated with general development actions have surface disturbance totaling approximately 16,074 acres. These actions total approximately 122,266 acres of disturbance within the approximately 645,000-acre CESA for visual resources.

There are many actions that have an effect on the visual resources within the vicinity of the Project Area. The BLM's visual management for the Project Area allows for substantial change to the visual characteristics of the area. Therefore, the cumulative impacts to visual resources from the Slower, Longer Project Alternative, along with the past and present actions and the RFFAs would not be significant; however, activities to minimize the visual effects are incorporated in the Project reclamation plan. In addition, VRM classes do not establish management direction and should not be used as a basis for constraining or limiting surface disturbing activities.

4.8.6 Soils

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect soil resources. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for soil resources covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the soil resources within the CESA.

4.8.7 Vegetation Resources

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for vegetation covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Slower, Longer Project Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit

of the Slower, Longer Project Alternative represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs. The vegetation communities within the CESA are similar to those within the Project Area and common in the region. The cumulative and incremental effect of vegetation removal or modification would be below the level of significance.

The four special status plant species with potential habitat within the Project Area (Beatley buckwheat, least phacelia, Monte Neva Indian paintbrush, and windloving buckwheat) also have potential habitat within the CESA. None of these species has been documented as occurring within the CESA; however, no systematic survey has been completed. The cumulative effect and incremental loss of potential habitat for the four special status plant species resulting from past and present actions, proposed actions, and RFFAs would be below the level of significance.

4.8.8 Noxious Weeds, Invasive and Nonnative Species

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation, noxious weeds, and invasive, nonnative species. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for noxious weeds and invasive, nonnative species covers approximately 262,490 acres. Therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA. The Slower, Longer Project Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit for the Slower, Longer Project Alternative represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs.

An infestation of noxious weeds and invasive, nonnative species that starts in one project may expand to outside areas and increase the chance of the introduction of noxious weeds and invasive, nonnative species to other disturbed locations. The operational performance standards identified to reduce the potential impacts of the Slower, Longer Project Alternative would help to control noxious weed establishment and spread within and adjacent to the Project Area; therefore, the cumulative and incremental effect of surface disturbance on noxious weed management would be below the level of significance.

4.8.9 Wetlands and Riparian Zones

Total past actions, present actions, and RFFAs would result in up to approximately 55,515 acres of surface disturbance that would affect vegetation; however, this disturbance is likely to occur in vegetation communities other than the riparian vegetation community. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements either because of their perpetual nature or lack of state or federal statutory requirements for reclamation. The CESA for wetlands and riparian zones covers approximately 262,490 acres; therefore, all actions within the CESA would affect approximately 21 percent of the vegetation within the CESA, which includes an indirect impact to approximately five acres of

riparian vegetation community. The Slower, Longer Project Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit for the Slower, Longer Project Alternative represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs. The cumulative and incremental effect to wetlands and riparian zones would be below the level of significance. Mitigation for this alternative is outlined in Section 3.11.3.7.

4.8.10 Livestock Grazing and Production

Total past actions, present actions, and RFFAs would result in up to approximately 210,073 acres of surface disturbance in the CESA; however, approximately 90,339 acres of surface disturbance is, or would be, associated with habitat stabilization, rehabilitation, and rangeland improvements, which would result in positive impacts to livestock grazing and production in the CESA. The majority of the 210,073 acres would be reclaimed and available for livestock grazing after the completion of reclamation activities. Approximately 781 AUMs would be lost in the Project Area due to the enclosure which is six percent of the current active grazing preference.

4.8.11 Wild Horses

Total past actions, present actions, and RFFAs would result in up to approximately 16,777 acres of surface disturbance that would affect wild horses. The majority of this disturbance is associated with mining operations and is subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for wild horses covers approximately 253,610 acres. Therefore, all actions within the CESA would affect approximately 6.6 percent of the vegetation within the CESA. The Slower, Longer Project Alternative would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit for the Slower, Longer Project Alternative represents less than six percent of the total surface disturbance resulting from past, present, and RFFAs. The implementation of mitigation measures identified in Chapter 3 of this EIS limit the loss of habitat and water sources to wild horses in the Project Area by development of six water sources; therefore, the cumulative and incremental effects to wild horses would be below the level of significance.

4.8.12 Land Use

The current uses of the public lands within the Project Area are similar to those within the CESA and common to the region. The cumulative and incremental effect of the permanent loss of public lands managed for multiple uses within the CESA would be below the level of significance; however, under the RFFA, of the sale of a major portion of the Project Area, land use and access through that portion of the Project Area would be substantially changed.

4.8.13 Recreation and Wilderness Study Area

Total past actions, present actions, and RFFAs would result in up to approximately 530,467 acres of surface disturbance that would affect recreation, as well as potential indirect effects to high use recreation locations associated with the Roberts Creek drainage. The CESA for recreation and wilderness covers approximately 1,970,179 acres; therefore, approximately 27 percent of the CESA would be impacted. The present actions and RFFAs associated with mineral operations

and other activities on BLM-administered lands are subject to reclamation requirements, which would restore areas for future use and minimize the long-term impacts. In addition, approximately 444,094 acres of surface disturbance is, or would be, associated with habitat stabilization and rehabilitation, which would result in positive impacts to recreation and wilderness in the CESA; therefore the quality of the area available for future recreational opportunities would be improved, and there would be no unmitigated loss of a unique recreational resource. While any one, or all, of these activities occurs there would be a reduction in the quality of the recreational or wilderness experience in portions of the CESA.

It is not known which activities, other than the Slower, Longer Project Alternative, may result in restrictions to access of recreation areas, but very few restrictions are anticipated. The permanent access restriction as a result of the Slower, Longer Project Alternative would account for only 0.04 percent of the CESA; therefore, the cumulative and incremental effect of the permanent access restriction from public lands managed for multiple uses within the CESA would be below the level of significance.

4.8.14 Auditory Resources

Each of the identified individual projects within the CESA, including the proposed mining operations, contributes noise to the natural environment. Since the Slower, Longer Project Alternative is the principal and dominant noise generating activity within the CESA, its potential impacts are less than significant (Section 3.16.3.3), and any present actions and RFFAs would be dispersed throughout the CESA, none of the projects including the Slower, Longer Project Alternative would result in a significant cumulative impact to the auditory resources.

4.8.15 Socioeconomic Values

The identified projects within the CESA, including the Slower, Longer Project Alternative, would have a net beneficial impact on social and economic values in Eureka County. As stated in Section 3.17, EML has and would continue to coordinate with Eureka County to address these impacts and minimize the short-term fiscal impacts on the County.

4.8.16 Environmental Justice Effects

Initial analysis concluded that the potential effects of the Project are not expected to disproportionately affect any particular population. Environmental effects that may occur at a greater distance, such as auditory resource or air impacts, would affect the area's population equally, without regard to nationality or income level. Since no disproportionate effect on an identified minority population results from the Slower, Longer Project Alternative or the RFFAs, no further environmental justice analyses are required.

4.8.17 Hazardous Materials

The present actions and RFFAs within the CESA, including the proposed mining operations, contribute to potential hazardous materials effects to the natural environment. Since the Proposed Action is the principal hazardous materials generating activity within the CESA, its potential impacts are less than significant (Section 3.19.3.3), and any existing action and RFFAs such as

traffic on SR 278 would be dispersed throughout the CESA, there would be no significant cumulative hazardous materials impact.

4.8.18 Historic Trails

The identified projects within the CESA, including the Slower, Longer Project Alternative have an impact on the visual setting for the historic trail by adding visual elements that may detract from the experience of those using the trail. These impacts are significant. In addition, there is no mitigation that could reduce the impact to less than significant. In addition, under the RFFA of the sale of a major portion of the Project Area, access through that portion of the Project Area could be eliminated.

4.8.19 Cultural Resources

The identified projects within the CESA, including the Slower, Longer Project Alternative have a direct physical impact on the cultural resources and an indirect impact on the visual setting for specific cultural resources that are potentially significant. Within the cumulative effects viewshed APE, a total of 436 eligible and unevaluated historic (361) and multi-component (75) sites with a historic component would be visually impacted. This number includes 152 officially eligible historic sites and 39 officially eligible multi-component sites with a historic element within the Project APE (Table 3.21-1). Impacts to these sites would be mitigated through the implementation of a treatment plan. Outside of the Project APE and within the viewshed APE, an additional 245 eligible or unevaluated historic and historic component sites may be adversely impacted. All adverse effects under the NHPA and direct and indirect impacts under NEPA to known-eligible properties identified within the Project APE would be mitigated in accordance with the PA and the treatment plan prepared for the Project. Any previously unknown-eligible properties that may be discovered during construction activities would be mitigated in accordance with the PA. Therefore, no additional mitigation or monitoring is proposed. No residual adverse effects are anticipated, as all known-eligible sites would be mitigated in accordance with the PA and the treatment plan prepared for the Project. Any previously unknown-eligible properties that may be discovered during construction activities would be mitigated in accordance with the PA.

4.8.20 Native American Traditional Values

The identified projects within the CESA, including the Slower, Longer Project Alternative have an impact on Native American Traditional Values, which include pine nut gathering and water resources. Although this alternative would not result in the removal of any piñon-only woodlands, the Slower, Longer Project Alternative's removal of piñon trees and limiting of access to other piñon trees in piñon-juniper woodland within the fenced Project Area, relative to all other impacts to piñon trees, is not readily quantifiable; however, it is likely less than one percent of all the piñon trees within the piñon-only and piñon-juniper woodlands in the CESA. In addition, the cumulative effect to piñon trees, relative to the total number of piñon trees within the Native American CESA is small (Figure 4.3.3) The Proposed Action's potential effect to water resources from ground water pumping, as shown on Figure 4.4.2, which is representative of the ground water pumping effects of the Slower, Longer Project Alternative, is isolated from the ground water pumping associated with the other mining operations within the Native American CESA. Figure 4.4.2 also shows the location of projects within the CESA where the

removal or retrieval of pre-historic artifacts have occurred or may have occurred. Figure 4.4.2 does not show any potential effects from ground water pumping associated with agricultural operations. The Slower, Longer Project Alternative's potential effects to water resources is incrementally a small percent of the total potential effect to water resources from ground water pumping operations.

4.8.21 Wildlife and Fisheries Resources

Total past actions, present actions, and RFFAs would result in up to approximately 540,812 acres of habitat disturbance in the CESA; however, approximately 47,094 acres of habitat disturbance is, or would be, associated with habitat stabilization, rehabilitation, and rangeland improvements that would result in positive impacts to wildlife and fisheries resources in the CESA. Significant cumulative impacts to the wildlife and fisheries habitat in the CESA would not be anticipated because the vast majority of land would be reclaimed. Even though none of the perennial drainages, including those that support sport fisheries, would appear to be affected hydrologically, there is a potential to affect stream flow through ground water pumping from the Slower, Longer Project Alternative and thus affect the fisheries. Due to the widely dispersed nature of the existing and reasonably foreseeable individual mining projects within the CESA, cumulative noise and traffic impacts would not cause a substantial disturbance to wildlife populations or critically reduce use of their habitat.

Mitigation for impacts to wildlife resources is presently in Chapter 3 of this EIS and includes measures to protect greater sage-grouse, LCT, and migratory birds. Impacts to other wildlife and fisheries resources are below the level of significance.

4.8.22 Transportation and Access

The current access of the public lands within the Project Area are similar to those within the CESA and common to the region. The current transportation uses in the vicinity of the Project Area are similar to those with the CESA and common to the region. The cumulative and incremental effect of the permanent loss of public lands managed for multiple uses (734-acre area of the open pit) within the CESA would be below the level of significance; however, under the RFFA, of the sale of a major portion of the Project Area, access through that portion of the Project Area would be substantially changed.

4.8.23 Forest Products

Total past actions, present actions, and RFFAs would result in up to approximately 28,309 acres of surface disturbance that would affect forest products. The past actions are generally not subject to any reclamation activities. The present actions and RFFAs associated with mineral, geothermal, and oil and gas operations are subject to reclamation requirements, which would minimize any impacts; however, all other present actions and RFFAs would not be subject to reclamation requirements. The CESA for forest products covers approximately 515,000 acres. Therefore, all actions within the CESA would affect approximately five percent of the vegetation within the CESA. The Proposed Action would disturb approximately three percent of the CESA. The amount of area that would not be reclaimed (734 acres) associated with the open pit for the Slower, Longer Project Alternative represents less than two percent of the total surface disturbance resulting from past, present, and RFFAs. The vegetation communities within the

CESA are similar to those within the Project Area and common in the region. The cumulative and incremental effect of vegetation removal or modification would be below the level of significance.

4.9 Irreversible/Irretrievable Commitment of Resources

Construction and operation of the Project could result in either the irreversible or irretrievable commitment of certain resources. Irreversible is a term that describes the loss of future options. It applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over very long periods of time. Irretrievable is a term that applies to the loss of production, harvest, or use of natural resources. For example, livestock forage production from an area is lost while an area is serving as a mining area. The production lost is irretrievable, but the action is not irreversible. If the use changes and the mine is reclaimed, it is possible to resume forage production. Irreversible and irretrievable impacts of the Proposed Action are summarized in Table 4.9-1.

Table 4.9-1: Irreversible and Irretrievable Commitment of Resources by the Proposed Action

Resource	Irreversible Impacts	Irretrievable Impacts	Explanation
Water Resources- Water Quantity	Yes	Yes	Water removed from the aquifer and used in the operations would not be available for other uses. In addition, springs and surface waters may have decreased flows and limited uses.
Water Resources- Water Quality	No	No	The Proposed Action would not result in an irreversible or irretrievable commitment of resources.
Geology and Mineral Resources	Yes	Yes	Mineral resources that are mined would no longer be available for future production.
Paleontology	No	No	The Proposed Action would not result in an irreversible or irretrievable commitment of resources.
Air Resources	No	No	Emissions from the Project would not deteriorate the existing air quality of the air basin. In addition, air impacts are not considered irreversible because they would cease when mining operations cease.
Visual Resources	Yes	Yes	Impacts to visual resources would result in unavoidable physical changes in the existing contour, line, texture, and character of the Project Area. The changes would be visually apparent over the active life of the Project. These would diminish through the completion of reclamation and revegetation activities; however, they would not be eliminated.
Soil Resources	Yes	No	Soils from the open pit, waste rock dump, and heap leach/tailings areas would be salvaged for use in the reclamation activities. There would be a permanent loss of soil from wind and water erosion, as well as some amount of soil that would not be recovered and stockpiled.
Vegetation Resources	Yes	Yes	A total of 734 acres of vegetation would be lost as a result of the open pit development. There is a potential for a loss of phreatophytic vegetation in drawdown area in Kobeh Valley.
Invasive Nonnative Species	No	No	Implementation of reclamation and the noxious weed monitoring and control plan would reduce or eliminate the establishment of noxious weed infestations.

Resource	Irreversible Impacts	Irretrievable Impacts	Explanation
Wetland/ Riparian Zones	No	Yes	Certain springs and their associated wetlands would be removed or buried as a result of the development of the open pit and WRDFS. Following Project completion and reclamation, residual adverse impacts to riparian zones from the Proposed Action would be minor. The Project would not result in the removal or disturbance of wetlands in the Project Area.
Livestock Grazing and Production	Yes	Yes	There would be a loss of 781 AUMs associated with the Project.
Wild Horses	Yes	Yes	The Proposed Action would result in the unavoidable loss of up to 734 acres of wild horse foraging habitat resulting from surface disturbance in the open pit area. In addition, in the short term, wild horses would lose access to over approximately 14,204 acres of habitat, which equates to a large portion of their existing HMAs. Wild horses would also be affected by the loss of water sources. Once reclaimed, the mine site may not be usable due to lack of waters. Also, water drawdown could cause permanent loss of riparian systems, and even if water levels resume, the loss of seed source, permanent change of soils, and the site may not be able to support riparian systems again.
Land Use	Yes	Yes	The Proposed Action would result in the unavoidable loss of up to 734 acres of public lands utilized for livestock grazing and mineral exploration. There would be no residual impact to access resulting from the Proposed Action. The Proposed Action would have the unavoidable, but reversible, indirect potential to adversely affect access through the Project Area for the life of the Project.
Recreation and Wilderness	Yes	Yes	The Proposed Action would result in the unavoidable loss of up to 14,204 acres in the short term, and an unavoidable and adverse loss of 734 acres in the long term of public land managed for multiple uses, including dispersed recreation. Certain recreation opportunities associated with surface water features may be indirectly affected due to the drawdown of the water table.
Auditory Resources	No	No	Noise is not considered irreversible because it would cease when mining operations cease.
Socioeconomic Values	Yes	No	The economic wealth generated from the production and further use of the molybdenite resources underlying the Project would be irreversible. The jobs, income, and taxes created over the life of the Project reflects irreversible resource commitment to achieve such production, but also represents a measure of economic benefits associated with the Project.
Environmental Justice	No	No	No irreversible or irretrievable environmental justice issues have been identified as a result of the Proposed Action.
Hazardous Materials	No	No	No irreversible or irretrievable hazardous materials impacts are anticipated; however, if a spill were to affect a sensitive resource, an irretrievable impact could occur pending the recovery of the resource.
Historic Trails	Yes	No	The visual setting for the historic trail is irreversible changed by the Project. The overall impact to historic trail access is not irreversible or irretrievable.

Resource	Irreversible Impacts	Irretrievable Impacts	Explanation
Cultural Resources	Yes	Yes	With the implementation of mitigation measures, the Proposed Action would result in a less than significant impact; however, the potential impact would remain an irreversible and irretrievable commitment of cultural resources.
Native American Traditional Values	Yes	Yes	The removal of cultural sites from the landscape is an irretrievable commitment of Native American resources. No other irreversible or irretrievable impacts to Native American Traditional Values have been identified as a result of the Proposed Action.
Wildlife and Fisheries Resources	Yes	Yes	A total of 734 acres of wildlife habitat would be lost as a result of the open pit development.
Transportation and Access	No	No	No other irreversible or irretrievable impacts to Transportation and Access have been identified as a result of the Proposed Action.
Forest Products	No	Yes	Forestry products in the area of the open pit would be irretrievably committed as a result of the development of the open pit.