

# **BRETZ MINE ABANDONED MINE LAND PHYSICAL HAZARD REMEDIATION PHASE 1**

**Environmental Assessment OR-030-08-006**



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**BLM/OR/WA/AE-009/035-1792**



**ENVIRONMENTAL ASSESSMENT**  
**Bretz Mine Abandoned Mine Land Physical Hazard Remediation – Phase 1**

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**ENVIRONMENTAL ASSESSMENT**  
**Bretz Mine Abandoned Mine Land Physical Hazard Remediation – Phase 1**

## **1 Introduction**

### **1.A Background Information**

The Bretz Mine (mercury) was located in 1917 by William Bretz who later discovered the nearby Opalite Mine (mercury). The two primary ore bodies of the Bretz Mine were exhausted by 1936. Records indicate that mercury mining and processing operations occurred at Bretz Mine from 1931 through 1968. Approximately 15,000, 76-pound flasks of mercury were produced from the mine.

Evaluation of the physical and chemical hazards at Bretz Mine and surrounding areas began in 2001 with studies by the United States Environmental Protection Agency (USEPA) in conjunction with the Oregon Department of Environmental Quality (ODEQ). Bretz Mine is located on public land and potential hazardous waste sources are associated with the ore processing/retort area, tailings impoundments, and pit lake. Physical hazards at Bretz are associated with pit high walls in the mine pits, one shaft, one open adit, unprotected loading chutes, dilapidated structures, and open underground pipe works. The disturbed area encompasses approximately 150 acres of public land within an area of about 1,700 acres influenced by exploration roads and dispersed prospect pits.

Little Cottonwood Creek and two of its unnamed tributaries flow through this mine site. These drainages have intermittent flows that occur during snow melt periods and heavy storm events. At least four impoundment dams exist across Little Cottonwood Creek at the mine site and contain sediment eroded from the mine waste dumps, open pits, and processing facilities.

One open pit exists near the northwestern boundary of the site. This pit seasonally contains turquoise blue water. Water level in this pit can vary from 2' to 25' depending on the seasonal precipitation events. The pH results from this pond range from 3.5 to 4.5. Analytical results from the mercury processing area which includes a four-cell mercury retort contained up to 18,000 mg/kg mercury (Hg) and 737 mg/kg arsenic (As).

The 15-acre area process area containing the retorts contains abandoned ore treatment equipment and various machinery and equipment parts. Post-process mercury ore was deposited down-slope, south of the retort area and has eroded to a constructed tailings pond area where soil sample analysis indicates 613 mg/kg Hg and 361 mg/kg As. In a future rehabilitation effort, the retort and four inches of soil will be removed from the site and transported to an authorized hazardous waste disposal facility.

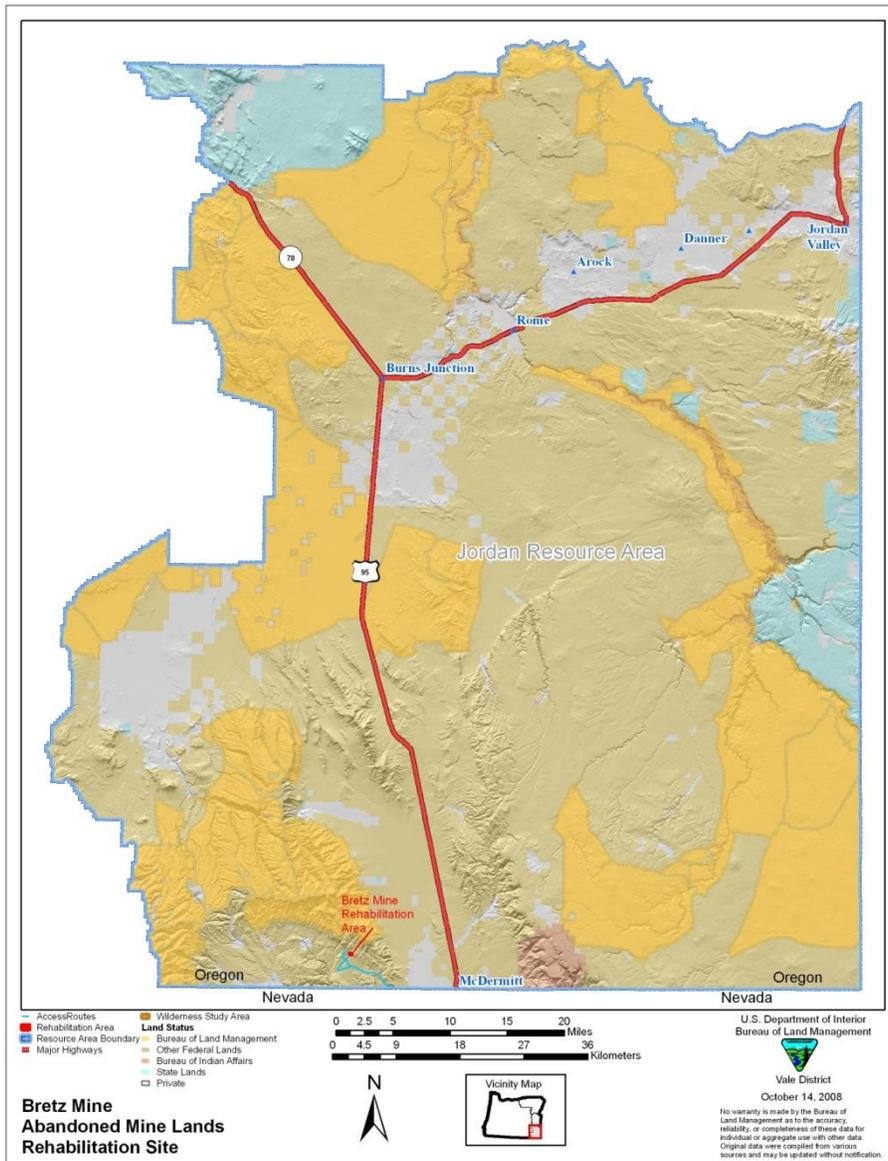
Physical and chemical hazards were isolated by means of a perimeter fence completed in 2007. Reducing and eliminating physical hazards and hazardous waste sources would benefit health and safety issues and the overall improvement of the public land.



This site has been assigned number ORN001002311 within the Environmental Protection Agency's (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) or Superfund Program.

### 1.B Location of Proposed Action

The Bretz Mine is located approximately 11 miles west of McDermitt, Nevada north of the Disaster Peak Road (see Vicinity Map). Generally the mine is located in T. 41 S., R. 41 E., Sections 3 and 4 and T. 40 S., R. 41 E., Sections 33 and 34. The proposed reclamation at the East Pit site is located in T. 41 S., R. 41 E., Section 3, SE¼NW¼.



Map 1: Jordan Resource Area, Vicinity Map, Bretz Mine Rehabilitation Area



## **2 Purpose of and Need for the Action**

The purpose of the proposed action is to mitigate physical hazards associated with the eastern open mining pits at the Bretz Mine. This action is the second phase of a multi-phase project to eventually complete rehabilitation of the most hazardous portions of the mine site. Future phases would require additional hazard mitigation associated with the western and central pit areas and clean-up of the mercury ore processing area.

The southeastern pit of the Bretz Mine (East Pit) was constructed as an elongate excavation approximately 50 feet deep on the southern side. The pit has an unimproved road that allows vehicle travel from south to north terminating at the crumbling pit edge. An unsuspecting vehicle operator could, potentially, drive over the pit edge and plunge to the pit bottom. The proposed action would minimize the potential for a catastrophic accident.

## **3 Conformance with the Land Use Plan**

All actions approved or authorized by the BLM must conform to the existing land use plan where one exists (43 CFR 1610.5-3, 516 DM 11.9). Although it is not a NEPA requirement, the BLM includes within all its NEPA documents a statement about the conformance of the proposed action and alternatives with the existing land use plan (LUP). The BLM's planning regulations state that the term "conformity" or "conformance" means that "... a resource management action shall be specifically provided for in the plan, or if not specifically mentioned, shall be clearly consistent with the terms, conditions, and decisions of the approved plan or amendment" (43 CFR 1601.0-5(b)).

The proposed action has been reviewed and found to be in conformance with the multiple use recommendations and alternatives of the Southern Malheur Management Framework Plan (SMFP) (March 1983) and the Southeastern Oregon Resource Management Plan and Final Environmental Impact Statement (SEORMPFEIS) (April, 2001). These recommendations and alternatives are cited within:

SMFP – Step 3, Visual Resource Management, SQRU.044 indicates that the Bretz Mine area is incompatible with scenic quality until such time as reclamation is completed.

SEORMPFEIS, Volume 2, Appendix O, Best Management Practices, Surface Disturbing Activities; 3) Disturbed areas should be contoured to blend with the natural topography. Blending is defined as reducing form, line, and color contrast associated with the surface disturbance. Disturbance in visually sensitive areas should be contoured to match the original topography, where matching is defined as reproducing the original topography and eliminating form, line, and color caused by the disturbance as much as possible; 4) Reclamation should be implemented concurrent with construction and site operations to the fullest extent possible. Final reclamation actions shall be initiated within 6 months of the termination of operations unless otherwise approved in writing by the authorized officer; 5) Fill material should be pushed into cut areas and up over back slopes. Depressions should not be left that would trap water or form ponds.



The proposed action is also in accordance with the Vale District Five-Year Noxious Weed Control Plan (ROD, 2006).

Federal laws that influence the cleanup of AML sites include the Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The proposed action is consistent with the following laws, regulations and plans:

The Federal Land Policy and Management Act of 1976 (FLPMA) (43 U.S.C. 1701 *et seq.*)

This law establishes the environmental protection requirements for the use, occupancy, and development of the public lands. Section 302 of the act directs the Secretary of the Interior to: (1) Manage the public lands under the principles of multiple use and sustained yield in accordance with approved land use plans, (2) To regulate the use, occupancy and development of the public lands, and (3) To prevent unnecessary and undue degradation of the public lands. Abandoned mines addressed by the program are those that were abandoned prior to January 1, 1981, the effective date of BLM's Surface Management regulations issued under authority of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1701 *et seq.*).

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 U.S.C. 9601 *et seq.*) and National Contingency Plan (NCP) (40 CFR Part 300).

Federal Watershed Restoration and Enhancement Agreements (“Wyden Amendment”) 16 U.S.C. 1011.

Oregon State-wide Planning Goals (1985)

This document outlines the planning goals of the Oregon Department of Land Conservation and Development. The proposed action generally conforms with those goals, and more specifically to Goal 9-Economy of the state.

#### **4 Alternatives Including the Proposed Action**

The objective of alternative actions is to evaluate the most cost effective, environmentally sensitive, and logistically efficient way to rehabilitate the abandoned mercury mine site. Each alternative focuses on protecting and/or improving public land resource values consistent with public land management objectives identified in the MFP and the SEORMP. Information pertaining to the Bretz Mine and ore processing areas was attained from data collected beginning in 2001 and this information was considered in evaluating the alternatives. Chemical samples collected during site characterization documented mercury contamination in the ore processing area and several locations in the mine area.

In 2001, BLM submitted a budget project proposal for the rehabilitation and hazard removal from the Bretz Mine. Budget constraints since 2002 have allowed for portions of the proposed project



to be completed but have not allowed for the project to be completed in one campaign. It is anticipated that should budget allowances remain at current levels it will take five years to realize completion of full rehabilitation. Therefore, this project will be segmented into phases that result in a completed rehabilitation project. Current budget considerations will not accommodate the rehabilitation of the areas of the mine contaminated by mercury and arsenic.

The field data, existing file data and conversations with engineering and resource staff were used to formulate alternatives that provide reasonable economic alternatives that focus on human safety and resource protection.

#### **4.A No Action**

Under the no action alternative, no reclamation or rehabilitation of the East Pit at Bretz Mine would take place. The existing enclosure fence would remain in place and the East Pit would remain in the current condition. The mine site is designated as a non-priority CERCLA site primarily because there is no immediate concern for off-site water contamination. Future attempts to rehabilitate portions of the mine would continue at the mercury processing area as future funding becomes available.

#### **4.B Bretz Mine, East Pit, physical hazard mitigation (Proposed Action)**

The Vale District BLM is proposing to begin the reclamation of the East Pit by using mechanized equipment to reduce the slope of the southern pit high wall. The East Pit is an elongate pit generally open to topography east to west with pit walls to the north and south. The southern pit high wall was constructed as one vertical cut creating an average pit wall height of approximately 50 feet.



Figure 2: Photograph of the Bretz Mine East Pit looking east.





Figure 3: Photograph of the Bretz Mine East Pit looking northeast.

The proposed action would be to reduce the slope of a portion of the southern pit wall of the East Pit. Two Caterpillar D-8 bulldozers would be used to reduce the southern pit wall to approximately a 2:1 slope. The equipment will begin work on the western end of the pit where the pit walls are lower and continue to the east. The dozers will finally traverse the slope to reduce the potential for storm water erosion channeling. The site will be re-vegetated with the following seed mixture:

**Table 1: Rehabilitation Seed Mixture**

<u>Seed Mixture</u>		
<u>Species of Seed</u>	<u>Variety</u>	<u>Pounds/acre PLS</u>
bluebunch wheatgrass	(“Goldar” or “P7”)	16
bottlebrush squirreltail		8
Sandberg’s bluegrass		4
Thurber’s needlegrass		8
Total		36 lbs./acre PLS (broadcast rate)



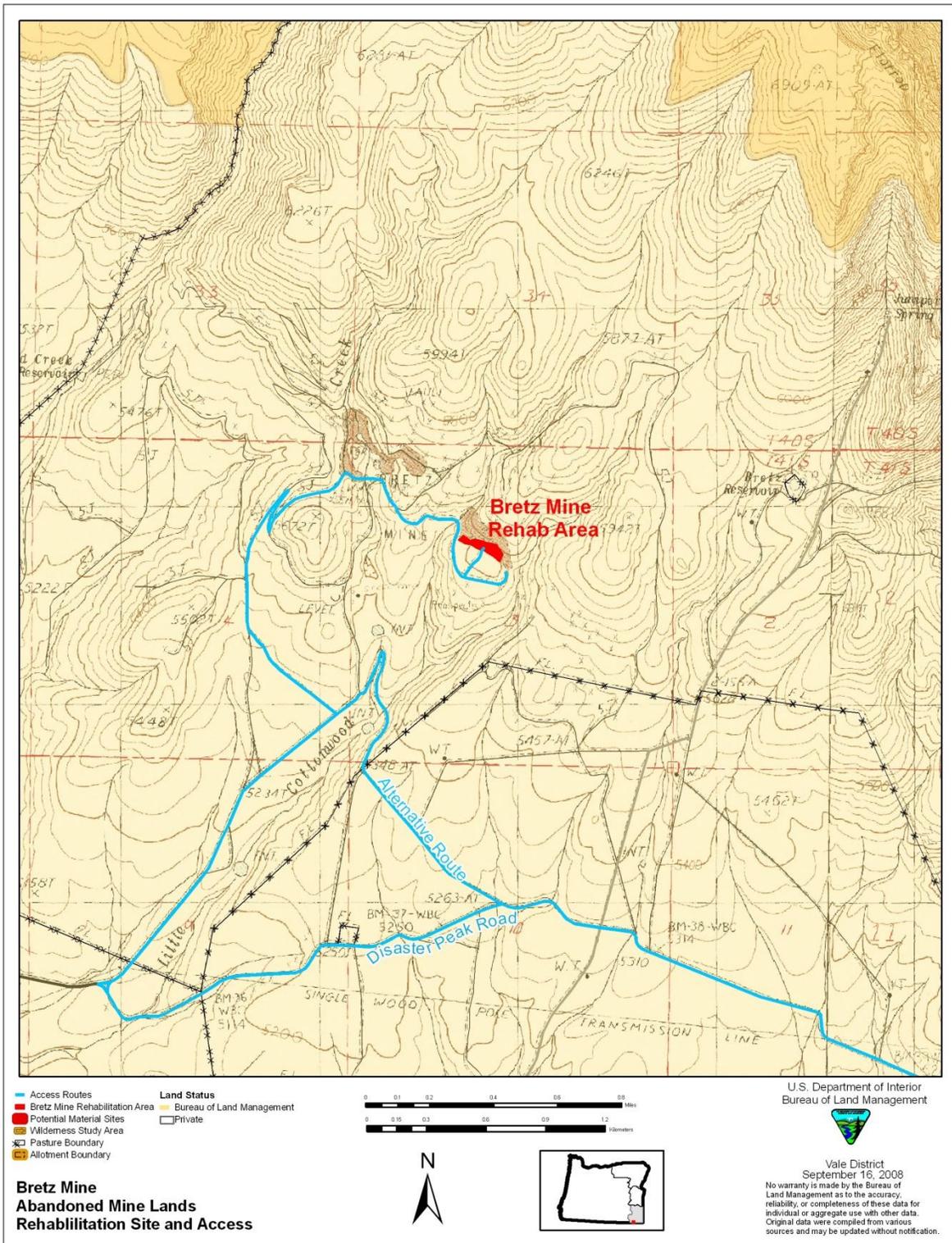


Figure 4: Jordan Resource Area, Vicinity Map, Bretz Mine East Pit Rehabilitation Site.



#### 4.C Alternatives Considered but Eliminated from Detailed Analysis

The Bretz Mine consists of three open pit areas, one adit, one shaft, and an ore processing area. Several evaluations have been completed to characterize the mercury contamination and the potential for contaminant excursions to McDermitt Creek via the Cottonwood Creek drainages. The Bretz Mine is bisected by Little Cottonwood Creek which could provide water flow to Cottonwood Creek and eventually to McDermitt Creek.

The western pit is characteristic of the mining style at Bretz with near-vertical pit walls and the potential for human hazard. This pit also contains an intermittent pit lake with water quality less than the Oregon drinking water standard. The cost to rehabilitate this pit is estimated to be greater than the available funds. Rehabilitation of this pit could be completed using the same methods as proposed for other portions of the mine, in that, pit wall rock material would be dozed into the pit and contoured to reduce eliminate the physical hazard and the pit lake.

The central pit has near-vertical, unstable pit walls and encompasses more area than the other two pits. Again, the cost to reclaim this pit is estimated to exceed the available project funding.

The mercury processing area contains four mercury retorts, processed mercury ore reject area, tailings disposal area, and various concrete and metal structures. Current funding levels will not accommodate remediation and closure of this area.

### 5 Affected Environment

This section presents relevant resource components of the existing environment which constitute baseline information.

#### 5.A Vegetation

Vegetation in Defenbaugh Pasture of McCormick Allotment consists of shrub steppe plant communities dominated by sagebrush species and bunchgrasses. The vegetation type which covers the majority of the allotments is dominated by Wyoming big sagebrush (*Artemisia tridentata ssp wyomingensis*) with an understory of perennial grass species, primarily bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg bluegrass (*Poa secunda*), Thurber's needlegrass (*Stipa thurberiana*), low sage (*Artemisia arbuscula*), perennial forbs (*Agoseris* spp., *Penstemon speciosus*, *Lomatium* spp., *Allium* spp., *Lupinus uncialis*), squirreltail (*Sitanion hystrix*) and basin wildrye (*Leymus cinereus*). Some of the area has a degree of invasion by annual species including cheatgrass (*Bromus tectorum*).

One special status plant, smooth wild cabbage (*Caulanthus crassicaulis* var. *graber*), is known to occur near the proposed project at Bretz mine. Smooth wild cabbage is ranked on list 2 by ORNHIC, S1 by the State of Oregon and Bureau Sensitive by the BLM. This perennial or biennial mustard species is endemic to California, Nevada and Utah with northern most



extensions in southern Oregon. The three known populations located in the Vale District are found on Bretz mine, Cache Canyon and Disaster Peak road.

The proposed reclamation for Bretz mine could displace the smooth wild cabbage population on site. Reestablishment of the smooth wild cabbage may be possible through collection of seed from the closest populations, Cache Canyon and Disaster Peak road, and subsequent reintroduction in the disturbed area. While this species is not common in our district, it does appear to be stable in the majority of its distributions. The area of disturbance and its surroundings will be surveyed in the spring post construction to identify any sustenance or displacement of the population. All findings will be recorded.

Riparian area plants in drainages and areas around the livestock reservoirs and wet meadows consist mainly of sedge and rush species, while a few species of willow can be found sparsely scattered throughout the drainages in the watershed.

### 5.B Noxious Weeds

Much of the area surrounding the proposed project is relatively weed free. Roads are natural conduits for weed movement and the disturbances common to these vehicle travel routes support a few annual noxious weeds or weedy species. Small infestations of cheatgrass (*Bromus tectorum*) are common where livestock congregate near water sources, bed grounds and salt licks as well as near some of the old homesteads and historical military and freight routes that received heavy grazing as part of the settlement process. Other common annual or bi-ennial weeds associated with these areas include a variety of mustards, such as clasping pepperweed (*Lepidium perfoliatum*), tumble mustard (*Sysymbrium altissimum*), blue mustard (*Chorispora tenella*) and flixweed (*Descurainia sophia*), lambsquarter (*Chenopodium sp.*), kochia (*Kochia scoparia*), Russian thistle (*Salsola iberica*) and prickly lettuce (*Lactuca serriola*).

Russian knapweed (*Acroptilon repens*) and heart-podded and globe-podded whitetop species (*Lepidium sp.*) have been treated in the McDermitt area, with additional sites of whitetop treated along the Opalite mine loop road. Diffuse knapweed (*Centaurea diffusa*) has been treated as recently as September, this year, at Spring Creek crossing.

Large infestations of halogeton (*Halogeton glomeratus*) can be found along the roadway and other disturbed sites near McDermitt with dwindling populations nearer to the old mine site.

Small, isolated sites of several thistle species exist within the general area. Scotch thistle (*Onopordum acanthium*) has been found and treated at various sites along the Opalite mine loop road. Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*) are occasionally found in moister sites and meadow areas associated with riparian or ephemeral stream areas, springs and seeps.

### 5.C Special Status Plants

Construction of a fence for enclosure of Bretz Mine was completed in 2007. Along the west side of the mine site, this fence was placed adjacent to and east of a small road which bisects the only site of prostrate buckwheat (*Eriogonum prociduum*) managed by the Vale District. One other site



supporting the buckwheat occurs in Malheur County at nearby Opalite Mine on private land. This species is a Species of Concern with U.S. Fish and Wildlife Service and at one time had been considered a candidate for listing under the Endangered Species Act due to its rarity and potential threats. It is currently a Bureau Sensitive (BS) species.

Cattle trail along the new fence line and monitoring plots have been placed adjacent to the new fence both inside the protected area and outside in order to assess impacts of cattle on this population. Three 100 foot lines were placed inside the new fence and three 100 foot lines were placed outside the fence in the spring/summer of 2007 prior to turnout of cattle into this pasture. Density counts of *Eriogonum prociduum* will be made in belt transects either 6 inches or one foot in width (depending on initial sampling number) along the 100 foot lines and counted within the age class categories of 'seedlings,' 'immature,' 'mature/reproductive,' and 'senescent.' In the fall of 2007 following removal of livestock from the pasture, the plots will again be read for density counts, and any signs and other visual impacts of livestock will be recorded. If it is determined that ten or more percent of buckwheat plants were destroyed by livestock within the plots, the fence will be moved to the west beyond the buckwheat site prior to the next year's grazing.

These plots will be read and assessed each year until the fence is removed or relocated.

An additional special status plant, smooth wild cabbage (*Caulanthus crassicaulis* var. *graber*), is known to occur near the proposed project at Bretz Mine. Smooth wild cabbage is ranked on list 2 by ORNHIC, S1 by the State of Oregon and Bureau Sensitive by the BLM. This perennial or biennial mustard species is endemic to California, Nevada and Utah with northernmost extensions in southern Oregon. The three known populations located in the Vale District are found on Bretz mine, Cache Canyon and Disaster Peak road.

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#### 5.D Wildlife and Fish

The BLM's wildlife management focuses on the habitat needs and conditions required to sustain healthy populations of native fish and wildlife. Priority is given to special status species, species of concern, and locally important species.

No Threatened and Endangered species use the habitat within the east pit of the Bretz Mine and no critical or essential habitat would be affected by this action. Special status species and locally important species that occur within the project area may include Sage grouse, pygmy rabbits, pronghorn antelope, and bighorn sheep.



### 5.E Livestock Grazing

The proposed project area is situated within the Defenbaugh pasture (13,738 acres) located in the McCormick Allotment (# 01202). The allotment is authorized for 8,862 AUMs with a season of use of March 15 through December 31 of each year. The Defenbaugh pasture is generally used from March 15 through June 5 of each year by 90 to 500 cattle. The lower elevations of the pasture are dominated by cheat grass with scattered pockets of Wyoming Big Sage Brush and rabbit brush. The upper elevations are dominated by bluebunch wheatgrass, sandbergs bluegrass, and Wyoming big sagebrush.

### 5.F Recreation and Visual Resources

Dispersed outdoor recreation in the area of Bretz Mine and Cottonwood Creek primarily consists of hunting of big game and upland game. The Disaster Peak and Indian Creek Loop roads are access for dispersed camping for hunters and petrified wood rock collectors. The proposed project areas are located within visual resource management (VRM) IV. The management objectives of class IV are as follows:

Class IV- provide for management activities that require major modification of the landscape. These management activities may dominate the view and become the focus of viewer attention. However, every effort should be made to minimize the impact of these projects by carefully locating activities, minimizing disturbance, and designing the projects to conform to the characteristic landscape.

### 5.G Wilderness Study Areas

Wilderness Study Areas (WSA) are not present within the project area and therefore will not be discussed further in the affected environment. The mine area is 1.5 miles south of the Oregon Canyon WSA boundary.

### 5.H Non-Wilderness Study Area Lands with Wilderness Characteristics

The disturbance area associated with Bretz Mine has been excluded from any citizen-proposed wilderness characteristics unit (WCU) and 1,675 acres has been excluded from BLM's Oregon Canyon (contiguous) WCU (OR-036-035). WCU OR-036-035 was found to have wilderness characteristics. The open mining pits and remnant facilities eliminate the area's natural condition.

### 5.I Cultural Resources

Cultural resources in the project vicinity are associated with the historic use of this area are tied to landforms as transportation corridors (wagon roads), historic homesteads, early irrigation project features, early mining activity areas, and remains of stage and telegraph stations.



## 5.J Paleontological Resources

Miocene, Pliocene, and Pleistocene fossil flora and fauna have been located in volcanic tuffs, sandstone and siltstone beds and Pleistocene gravels in areas of southeastern Oregon. Fossil fauna include fish and Miocene mammals. A wide variety of plant species have been identified by leaf fossils of trees, shrubs, herbs and vines.

## 5.K Air and Atmospheric Quality

The Project area is located within the U.S. Environmental Protection Agency, Region 10, Eastern Oregon Air Quality Control Region. The air quality in the area is generally good and typical of large rural areas within the Great Basin and Owyhee Uplands. Wind measurements for the site have not been recorded. However, data from the Western regional Climate Center (WRCC) of the National Climate Data Center (NCDC) of the National Oceanic and Atmospheric Administration (NOAA) indicates that at site McDermitt, Nevada, 11 miles southeast of the Project area, the wind is from the south or southeast approximately 10 months of the year and the average speed is 7.8 MPH, with a low average speed of 6.4 MPH and a high average speed of 8.8 MPH (WRCC, 2007). Winds may also blow from the north and west. The average annual total precipitation is approximately 8.99 inches while the average annual maximum air temperature is 62.7 degrees F (WRCC, 2007). The principal source of air contaminants in the project area is from wind-blown dust, both off dry rangeland in the region and from occasional traffic along dirt roads. During the summer months dust storms and rangeland wildfires may negatively affect air quality.

## 5.L Geology

The Bretz Mine is geologically situated in the southern edge of the Owyhee Uplands physiographic province within the northern edge of the McDermitt Caldera. This area is within the transition area of the northern Basin and Range Province, the southern Owyhee Uplands, and the Snake River Plain (Orr and Orr, 1999). This region is characterized by Miocene basaltic and rhyolitic lava flow rocks generated from faults associated with the Northern Nevada Rift Zone (NNR) and volcanism associated with the McDermitt caldera. The NNR is a northwest trending fault zone extending from southern Nevada and terminating in southeastern Oregon. It has been suggested that the NNR is the southern extension of the north-west trending faults in southeastern Washington that acted as conduits for much of the Miocene Columbia River basalts (John et al, 2000).

The McDermitt volcanic field is Miocene age (23.8 to 5.3 million years old) and is primarily composed of rhyolite (Trh) lava flows, ash-flow tuffs, and tuffaceous sedimentary rocks associated with the McDermitt and Whitehorse calderas in extreme southeast Oregon. Notable ash-flows include the tuffs of Oregon Canyon, Long Ridge, Trout Creek Mountains and Whitehorse Creek. Earliest ash-flows are interbedded with Columbia River Basalt Group lava flows.

There are active mining claims at or in the vicinity of the proposed rehabilitation site.



**Table 2: Geologic Rock Units within the Project Area**

Province	Rock Unit	Rock Type	Age	Description
Eastern Oregon	Trh	Rhyolite and dacite	Pliocene? and Miocene	Ash-flow tuff, lava flows, pumice-lapilli tuff, coarse pumicite, flow breccia, and domal complexes of rhyolitic, rhyodacitic, and dacitic composition; in places includes peralkaline rhyolite and some andesite and andesite breccia. Locally porphyritic with phenocrysts of alkali feldspar, plagioclase, and minor augite, ferro-hedenbergite, hornblende, hypersthene, or biotite. Commonly flow banded; locally glassy. Many of the ash-flow tuffs exhibit flow features and only obscure vitro-clastic textures. In places includes interlayers of silicic volcaniclastic rocks and tuffaceous sedimentary rocks. Includes rhyolite at Owyhee Dam, Jump Creek Rhyolite, and Littlefield Rhyolite, all of Kittleman and others (1965); Dooley Rhyolite Breccia of Gilluly (1937), radiometrically dated at $14.7 \pm 0.4$ Ma by potassium-argon methods (Fiebelkorn and others, 1983); resurgent domal masses in McDermitt caldera area; and extensive unnamed flows and ash-flow tuffs in the central and southern part of the Owyhee Upland. Also includes isolated masses of dacitic and rhyodacitic flows, breccia, and ash-flow tuff along eastern slope of Cascade Range that are lapped by flows and sediments of the Madras (or Deschutes) Formation. Potassium-argon ages on rocks in unit from southeast Oregon range from about 13 to 16 Ma; lenses of interbedded tuffaceous sedimentary rocks locally contain a Miocene (Barstovian) vertebrate fauna.
Eastern Oregon	Tts correlative with Tvu in northern Nevada.	Tuffaceous sedimentary rocks, tuffs, pumices, and silicic flows	Miocene	Moderately well indurated lacustrine and fluvial (flood-plain) deposits of tuff, pumicite, palagonite tuff, and lesser siltstone, arkosic sandstone, and pebble and cobble conglomerate. Locally contains some lignite beds. Former glass in silicic vitroclastic debris commonly crystallized and altered to secondary silica minerals, alkali feldspar, zeolites, and clay minerals. Contains some welded and nonwelded ash-flow tuffs, and minor rhyolite flows. Widespread and abundant vertebrate fossils and minor plant fossils indicate that most of unit is of middle Miocene (Barstovian) age; parts of unit between Goose Lake and Warner Valley may include rocks of early Miocene age. Locally interlayered with and locally overlies basalt and andesite flows of unit Tmb. Overlies and locally interfingers with Picture Gorge Basalt (Thayer and Brown, 1966) and with Miocene basalt south of Prineville. Includes Mascall Formation of Merriam (1901), Sucker (Succor) Creek Formation of Corcoran and others (1962) and Kittleman and others (1967), Drip Spring Formation of Kittleman and others (1965, 1967), Trout Creek Formation of Smith (1926), and "rocks of Miocene age" of Malde and Powers (1962) in the southern Owyhee Upland province. In southeast Oregon, some of these rocks represent caldera and moat-fill deposits.

## 5.M Soils and Watershed Resources

### Soils

Soils in the area of the Bretz mine rehabilitation project are included in mapping unit 55-98 on slopes from 12 – 60 %. Unit 58 soils dominate the mapping unit on the gentler slopes with about 30% Unit 98 soils on the steeply sloping areas. For purposes of rehabilitation at the mine site, the pertinent soil description is for Unit 58 as Unit 98 is a miscellaneous land unit that consists of highly eroded and dissected raw old lacustrine sediments occurring as “badlands” often on slopes steeper than 60 percent.

Unit 55 soils are shallow, loamy, well drained soils with cemented pans. These soils occur on very extensive to moderately steep old fans and high terrace remnants. Native vegetation consists mostly of big sagebrush, low sagebrush, rabbitbrush, budsage, *Atriplex* spp., needlegrass, squirreltail grass, and Sandberg bluegrass. This soil has a high potential for rangeland seeding.



*Watershed*

This project is located within the Cottonwood Creek subwatershed which flows into the McDermitt watershed. This watershed is located within the Upper Quinn subbasin. All of the waters in this area flow into the Great Basin region.

*Riparian Resources*

The proposed rehabilitation site is within one quarter mile of Little Cottonwood Creek which has not been assessed according to riparian functionality. Little Cottonwood Creek does appear from informal site visits to have some perennial riparian areas. Approximately, two miles downstream, the rating on Cottonwood Creek becomes Properly Functioning.

5.N Mandatory Elements

The following elements of the human environment are subject to requirements specified in statute, regulation, or executive order and must be considered in all EA's and EIS's:

**Table 3: Mandatory Elements of the Human Environment**

Element	Relevant Authority	BLM Manual	
Air Quality	The Clean Air Act as amended (42 USC 7401 et seq.)	MS 7300	Not affected
Areas of Critical Environmental Concern	Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.)	MS 1617	Not present
Cultural Resources	National Historic Preservation Act as amended (16 USC 470)	MS 8100	Analyzed in this document
Farm Lands (prime or unique)	Surface Mining Control and Reclamation Act of 1977 (30 USC 1201 et seq.)		Not present
Floodplains	E.O. 11988, as amended, Floodplain Management, 5/24/77	MS 7260	Not present
Native American Religious Concerns	American Indian Religious Freedom Act of 1978 (42 USC 1996)	MS 8100	None known
Threatened or Endangered Species	Endangered Species Act of 1973 as amended (16 USC 1531)	MS 6840	Not present at work site; Bureau-sensitive species in vicinity.
Wastes, Hazardous or Solid	Resource Conservation and Recovery Act of 1976 (42 USC 6901 et seq.) Comprehensive Environmental	MS 9180 MS 9183	Not present at the work site, but are present in the vicinity. All emergency response procedures will be in accordance with the Burns-



	Response, Compensation, and Liability Act of 1980 as amended (42 USC 9615)		Vale Hazardous Materials Management Contingency Plan, 2008
Water Quality Drinking/Ground	Safe Drinking Water Act as amended (42 USC 300f et seq.) Clean Water Act of 1977 (33 USC 1251 et seq.)	MS 7240 MS 9184	Not affected.
Wetlands/Riparian Zones	E.O. 11990, Protection of Wetlands, of May 24, 1977	MS 6740	Not affected.
Wild and Scenic Rivers	Wild and Scenic Rivers Act as amended (16 USC 1271)	MS 8014	Not present
Wilderness and Wilderness Study Areas	Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.) Wilderness Act of 1964 (16 USC 1131 et seq.)	MS 8500	Not present as per wilderness characteristic evaluation of Oregon Canyon (contiguous), OR-036-035.
Environmental Justice	E.O. 12898 of February 11, 1994		Minority populations and low income populations not affected
Actions to Expedite Energy Related Projects	E.O. 13212 of May 18, 2001		Proposed action is not energy related nor would it affect production, transmission, or conservation of energy.

Elements not present or not affected will not be further analyzed within this environmental assessment.

## 6 Environmental Consequences

This chapter is organized by alternatives to illustrate the differences between the proposed action, alternatives, and the “no action” alternative.

### 6.A Alternative 1 (No Action Alternative)

#### 6.A.1 Vegetation

Under the no action alternative, riparian and other vegetation associated with the mine site would remain in its current quantity and condition. The perimeter fence would remain in place creating the potential for livestock and wildlife trails along the fence line.

#### 6.A.2 Noxious Weeds

Much of the area surrounding the proposed project is relatively weed free. Roads are natural conduits for weed movement and the disturbances common to these vehicle travel routes support



a few annual noxious weeds or weedy species. Noxious weed invasion of this area is focused on the disturbed areas of the open pits. An increase in the noxious weed population is not anticipated. Small infestations of cheatgrass (*Bromus tectorum*) are common where livestock congregate near water sources, bed grounds and salt licks as well as near some of the old homesteads and historical military and freight routes that received heavy grazing as part of the settlement process. Other common annual or bi-ennial weeds associated with these areas include a variety of mustards, such as clasping pepperweed (*Lepidium perfoliatum*), tumble mustard (*Sysymbrium altissimum*), blue mustard (*Chorispora tenella*) and flixweed (*Descurainia sophia*), lambsquarter (*Chenopodium sp.*), kochia (*Kochia scoparia*), Russian thistle (*Salsola iberica*) and prickly lettuce (*Lactuca serriola*).

Russian knapweed (*Acroptilon repens*) and heart-podded and globe-podded whitetop species (*Lepidium sp.*) have been treated in the McDermitt area, with additional sites of whitetop treated along the Opalite mine loop road. Diffuse knapweed (*Centaurea diffusa*) has been treated as recently as September, 2008, at Spring Creek crossing.

Large infestations of halogeton (*Halogeton glomeratus*) can be found along the roadway and other disturbed sites near McDermitt with dwindling populations nearer to the old mine site.

Small, isolated sites of several thistle species exist within the general area. Scotch thistle (*Onopordum acanthium*) has been found and treated at various sites along the Opalite mine loop road. Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*) are occasionally found in moister sites and meadow areas associated with riparian or ephemeral stream areas, springs and seeps.

It is anticipated that under the no action alternative the noxious weed population would remain at current levels and distribution. The Bretz mine is a recreational attraction for rockhounds and because of focused vehicle travel there may be a periodic increase in noxious weeds in the immediate mine area.

### **6.A.3 Special Status Plants**

One special status plant, smooth wild cabbage (*Caulanthus crassicaulis* var. *graber*), is known to occur near the proposed project at Bretz mine. Smooth wild cabbage is ranked on list 2 by ORNHIC, S1 by the State of Oregon and Bureau Sensitive by the BLM. This perennial or biennial mustard species is endemic to California, Nevada and Utah with northern most extensions in southern Oregon. The three known populations located in the Vale District are found on Bretz mine, Cache Canyon and Disaster Peak road. Under the No Action alternative, the site would remain in its current condition.

The site of prostrate buckwheat (*Eriogonum prociduum*) is located on the western edge of the mine site and under the No Action alternative, the site would remain in its current condition.



#### **6.A.4 Wildlife and Fish**

Under the No Action alternative existing habitat would remain undisturbed. Local populations of fish and wildlife would remain at existing levels.

#### **6.A.5 Livestock Grazing**

The No Action alternative would not alter current grazing activity. This portion of the Bretz Mine is currently surrounded by a fenced enclosure to enhance safety considerations but also precludes livestock grazing.

#### **6.A.6 Recreation and Visual Resources**

Opportunities for outdoor recreation and big game hunting would be unchanged. The visual resources would be unchanged or maintained under the no action alternative. The area would remain visually impaired due to the mining disturbance.

#### **6.A.7 Non-Wilderness Study Area Lands with Wilderness Characteristics**

Wilderness characteristics including the size, natural conditions, outstanding opportunities of solitude, and outstanding opportunities for primitive and unconfined recreation, and supplemental values would be unchanged under this alternative. The disturbance area associated with Bretz Mine (1,675 acres) has been excluded from any citizen-proposed wilderness characteristics unit (WCU) and has been excluded from BLM's Oregon Canyon (contiguous), OR-036-035, WCU. The open mining pits and remnant facilities eliminate the area's natural condition.

#### **6.A.8 Cultural Resources**

Under the No Action alternative, there would be no affect to any cultural and/or paleontological resources that might be present in the area.

#### **6.A.9 Soils and Watershed Resources**

Soil and water resources would remain unchanged with the No Action alternative. Erosion of the rock and soil would continue to migrate into the Cottonwood creek system. The impoundment structures historically constructed by the mining company within the local drainages would remain intact. These impoundments will likely prevent contaminated soil and surface water from migrating to McDermitt Creek.

### **6.B Alternative 2: Bretz Mine East Pit Physical Hazard Mitigation (Proposed Action)**

#### **6.B.1 *Vegetation***

Vegetation in the pasture would generally be unaffected by this action. The hazard mitigation site would be enhanced by providing more gentle slopes on which native vegetation would be reestablished.



Riparian area plants in drainages and areas around the livestock reservoirs and wet meadows would be unaffected by the rehabilitation project.

The perimeter fencing in the mitigation area would be removed allowing dispersed livestock and wildlife usage eliminating trailing along the fence lines.

### 6.B.2 Noxious Weeds

The rehabilitation project will disturb approximately two acres of previously disturbed ground in the mine area. The last effort of mining culminated in the late 1960's allowing the existing soil crusts to form and stabilize for approximately 40 years. The relatively light and stable weed population of this area could become unbalanced if an immediate re-vegetation effort is not completed. The proposed action does include re-vegetation of the area with native species.

Oregon Dept of Ag Noxious Weed Policy and Classification System can be found at: [http://egov.oregon.gov/ODA/PLANT/weed\\_index.shtml](http://egov.oregon.gov/ODA/PLANT/weed_index.shtml)

Malheur County's noxious policy and weed list can be found at <http://www.malheurco.org/weeds>

**Table 4: Noxious Weeds within the Vicinity of the Project**

Weed Species: Scientific Name	Weed Species: Common Name	ODA Classification	County Classification	Not Classified
<i>Bromus tectorum</i>	Cheatgrass		C	
<i>Lepidium perfoliatum</i>	Clasping pepperweed			X
<i>Sysymbrium altissimum</i>	Tumble mustard			X
<i>Chorispora tenella</i>	Blue mustard			X
<i>Descurainia sophia</i>	Flixweed			X
<i>Chenopodium sp.</i>	Lambsquarter			X
<i>Kochia scoparia</i>	Kochia		C	
<i>Salsola iberica</i>	Russian thistle			X
<i>Lactuca serriola</i>	Prickly lettuce			X
<i>Cirsium arvense</i>	Canada thistle	B	B	
<i>Onopordum acanthium</i>	Scotch thistle	B	B	
<i>Cirsium vulgare</i>	Bull thistle	B	C	
<i>Acroptilon repens</i>	Russian knapweed	B	B	
<i>Lepidium sp (Cardaria)</i>	Whitetop species	B	B	
<i>Centaurea diffusa</i>	Diffuse knapweed	B	A	
<i>Halogeton glomeratus</i>	Halogeton	B	C	



### **6.B.3 Special Status Plants**

One special status plant, smooth wild cabbage (*Caulanthus crassicaulis* var. *graber*), is known to occur near the proposed project at Bretz Mine. Smooth wild cabbage is ranked on list 2 by ORNHIC, S1 by the State of Oregon and Bureau Sensitive by the BLM. This perennial or biennial mustard species is endemic to California, Nevada and Utah with northern most extensions in southern Oregon. The three known populations located in the Vale District are found on Bretz Mine, Cache Canyon and Disaster Peak road.

The proposed reclamation for Bretz mine could displace a portion of the smooth wild cabbage population on site. Reestablishment of the smooth wild cabbage may be possible through collection of seed from the closest populations, Cache Canyon and Disaster Peak road, and subsequent reintroduction in the disturbed area. While this species is not common in our district, it does appear to be stable in the majority of its distributions. The area of disturbance and its surroundings will be surveyed in the spring post construction to identify any sustenance or displacement of the population. All findings will be recorded and BLM personnel will monitor equipment activity to avoid disturbance of the species wherever possible.

The site of prostrate buckwheat (*Eriogonum prociduum*) is located on the western edge of the mine site and under the Proposed Action alternative, the site would remain in its current condition.

### **6.B.4 Wildlife and Fish**

Approximately 3 acres of open pit mine will be rehabilitated at a site currently considered unsuitable as wildlife habitat. The ground at these locations has shallow soils, exposed rock, and vegetation that is relatively sparse, making this habitat marginal for use by wildlife.

Sage grouse use the surrounding area for nesting habitat, but no nesting areas (Leks) are known to occur within 1 mile of the proposed pit locations. Best Management Practices (BMP's) would be required during project implementation to minimize effects to Sage Grouse.

Pygmy rabbits may use the project area, but Pygmy rabbits are closely associated with deep soils, suitable for burrowing, and sage brush. The soil at the proposed pit locations is shallow, rocky, and unsuitable for pygmy rabbit burrows.

Sage grouse and pygmy rabbits are unlikely to be affected under this alternative. Beneficial or detrimental effects to other fish and wildlife species, including mule deer, pronghorn antelope, and bighorn sheep would be relatively minor.



### **6.B.5 Livestock Grazing**

Under this alternative there would be minimal effect to livestock grazing in the affected pasture. Approximately 0.0002% of the 13,738-acre Defenbaugh pasture would be affected. The Bretz mine area is rocky and disturbed by mining activity, where the vegetation is sparse and grazing is limited. No AUMs will be lost to permittees due to the site rehabilitation. Livestock would not be affected during the time of the rehabilitation because it is scheduled to take place in late January to early March and livestock grazing occurs from March 15 through December 31.

### **6.B.6 Recreation and Visual Resources**

Dispersed outdoor recreation activities would remain unchanged for approximately two years. Opportunities for hunting of big game would be unchanged. Access to the upper areas of the Bretz Mine would remain fenced until reclamation projects are complete. The visual resource management class IV of this area allows for moderate to major modification (respectively) of the landscape. The scope of the proposed project is within the management objectives for VRM class IV. The rehabilitation of the eastern pit would partially enhance the landscape view from primary access routes.

### **6.B.7 Non-Wilderness Study Area Lands with Wilderness Characteristics**

Wilderness characteristics including the size, natural conditions, outstanding opportunities of solitude, and outstanding opportunities for primitive and unconfined recreation, and supplemental values would be unchanged under this alternative.

As shown in Figure 5, the disturbance area associated with Bretz Mine (1,675 acres) has been excluded from any citizen-proposed WCU and has been excluded from BLM's Oregon Canyon (contiguous), OR-036-035, WCU. BLM's OR-036-035 has been found to possess wilderness characteristics in the area surrounding Bretz Mine. The site is 1.5 miles south of the Oregon Canyon WSA.



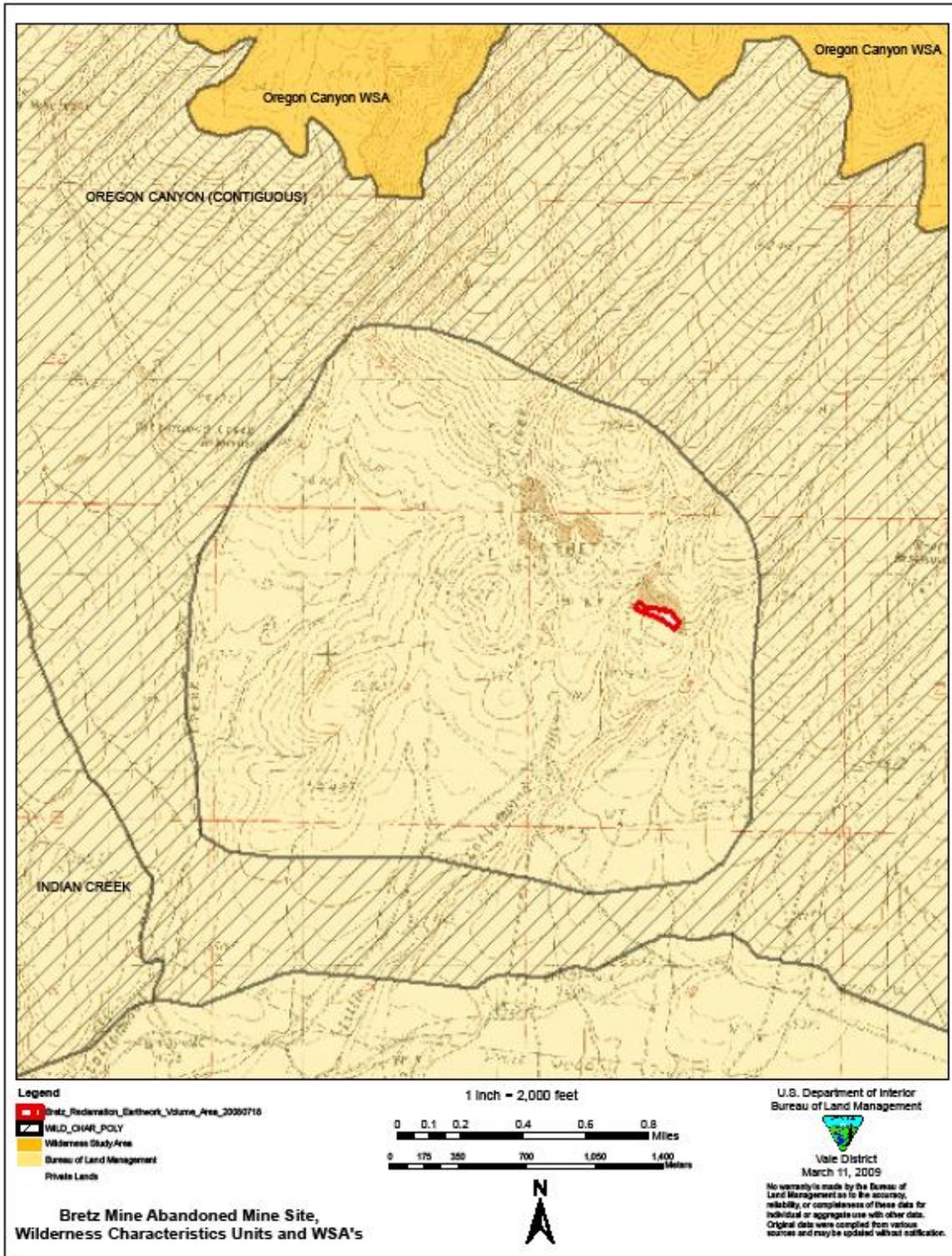


Figure 5: Jordan Resource Area, Vicinity Map, Brez Mine Wilderness Characteristics Units and WSA's.



### **6.B.8 Cultural and Paleontological Resources**

The rehabilitation area was surveyed for Cultural Resources on July 5, 2006, May 7, 2008 and July 6, 2008. The survey methodology utilized a Class III pedestrian survey with transects spaced 20m apart. No cultural resources were located at the proposed project location. No paleontological resources were found within the rehabilitation area.

Cultural resources associated with the mining and ore processing operations may be present in other areas of the mine but will not be affected by this action.

### **6.B.9 Air and Atmospheric Quality**

As previously stated, the principal source of air contaminants in the project area is from windblown dust, both off dry rangeland in the region and from occasional traffic along dirt roads. During the summer months dust storms and rangeland wildfires may negatively affect air quality. Project completion under this alternative would reduce the fugitive dust from the east pit area once native vegetation is established. Therefore, some measure of air quality improvement should be realized under Alternative 2.

### **6.B.10 Soils and Watershed Resources**

#### Soils

Soils on the south side of the east pit at the proposed rehabilitation site will be permanently altered. Rock and previously disturbed growth medium (a mixture of remnant soil and rock) will be moved by dozers to reduce the pit slope. The new slope will be re-vegetated with the proposed native seed mixture. Short-term erosional impacts are likely to occur if a significant precipitation event were to focus in the area of the mine. A higher than normal precipitation event would cause increased surface water flow that would erode the freshly disturbed surface material. These impacts will be limited or avoided by applying standard design features and best management practices (BMP's) to the proposed sites.

#### Watershed

Mining operations, like those at the Bretz Mine, can contribute to adverse watershed effects by increasing overland flow, erosion rates, and sediment transport to riparian conservation areas (RCA's) associated with intermittent and perennial streams. Adverse effects to water quality are anticipated to be minimized by the proposed action by designing the slope(s) to prevent further degradation of water quality standards. Implementation of established BMP's and adhering to State and Federal laws and regulations will further the potential for improved water quality in the long-term.

#### Riparian resources

Riparian soils and vegetation will remain in their existing condition as this proposed action is located outside RCA's. By utilizing the guidance listed above to minimize adverse water quality impacts, RCA's would be protected from adverse impacts associated with this alternative.



It is anticipated that reestablishing the native vegetation would contribute to improving RCA's by decreasing fugitive dust and the sediment load delivered to adjacent drainages.

## **7 Best Management Practices (BMP's)**

Best management practices (BMP's, Appendix O, SEORMPFEIS) are those land and resource management techniques designed to maximize beneficial results and minimize negative impacts of management actions. BMP's are selected and implemented as necessary, based on site-specific conditions, to meet water, soil, and resource management objectives. BMP's for this proposal are designed to assist in achieving the objectives for maintaining water quality, limiting disturbance to sensitive plants, fish, and wildlife, and reducing the likelihood of noxious weed spread.

### **Surface-Disturbing Activities**

- 1) Disturbed areas would be contoured to blend with the natural topography. Blending is defined as reducing form, line, and color contrast associated with the surface disturbance. Disturbance in visually sensitive areas would be contoured to match the original topography, matching is defined as reproducing the original topography and eliminating form, line and color caused by the disturbance as much as possible.
  - 2) Re-vegetation of the sites will be completed by using native seed mixtures.
  - 3) Reclamation and site stabilization would be implemented concurrent with construction and site operations to the fullest extent possible to allow for continued operation.
  - 4) Retain vegetation on cut slopes unless it poses a safety hazard or restricts maintenance.
  - 5) Retain adequate vegetation between pits and streams to filter runoff caused by disturbed soils. Should this become an operational restriction, then man-made sediment barriers will be installed.
  - 6) Avoid soil surface disturbance within riparian areas.
  - 7) Avoid placing overburden or soil in riparian areas, on floodplains, or in drainages.
  - 8) Fill material should be pushed into cut areas and up over back slopes. Depressions should not be left that would trap water or form ponds.
  - 9) The pit slope(s) will receive a final surface contour with horizontal ridges to limit downslope water flow.
  - 10) All contractors and land-use operators moving surface-disturbing equipment in or out of weed infested areas should clean their equipment before and after use on public land.
  - 11) Monitor and control weeds annually in areas disturbed by proposed actions.
  - 12) All seed, mulch, or other vegetation material transported and used on public land weed-free zones for site stability, rehabilitation or project facilitation should be certified by a qualified Federal, State, or county officer as free of noxious weeds and noxious weed seed.
  - 13) It is recommended that all vehicles, including off-road and all-terrain, traveling in or out of weed infested areas should clean their equipment before and after use on public land.
- For additional controls on noxious weed management please refer to the "Northwest Area Noxious Weed Control Program" (1987), the associated "Supplemental Environmental Impact Statement" and the "Vale District Fire-Year Noxious Weed Control Program Environment Assessment" (1987) with extensions.



## 8 Cumulative Effects

The Council on Environmental Quality (CEQ) defines cumulative effects as 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 (40 CFR 1508.7). A June 2005 CEQ memorandum states:

The environmental analysis required under NEPA is forward-looking, in that it focuses on the potential impacts of the proposed action that an agency is considering. Thus, review of past actions is required to the extent that this review informs agency decision making regarding the proposed action. This can occur in two ways:

First, the effects of past actions may warrant consideration in the analysis of the cumulative effects of a proposal for agency action. CEQ interprets NEPA and CEQ's NEPA regulations on cumulative effects as requiring analysis and a concise description of the identifiable present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have a continuing, additive and significant relationship to those effects. In determining what information is necessary for a cumulative effects analysis, agencies should use scoping to focus on the extent to which information is "relevant to reasonably foreseeable significant adverse impacts," is "essential to a reasoned choice among alternatives," and can be obtained without exorbitant cost (40 CFR 1502.22). Based on scoping, agencies have discretion to determine whether, and to what extent, information about the specific nature, design, or present effects of a past action is useful for the agency's analysis of the effects of a proposal for agency action and its reasonable alternatives. Agencies are not required to list or analyze the effects of individual past actions unless such information is necessary to describe the cumulative effect of all past actions combined. Agencies retain substantial discretion as to the extent of such inquiry and the appropriate level of explanation (*Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 376-77 [1989]). Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.

Second, experience with and information about past direct and indirect effects of individual past actions may also be useful in illuminating or predicting the direct and indirect effects of a proposed action. However, these effects of past actions may have no cumulative relationship to the effects of the proposed action. Therefore, agencies should clearly distinguish analysis of direct and indirect effects based on information about past actions from a cumulative effects analysis of past actions.

The geographic scope of this analysis considers that this proposed action is a site-specific action where potential impacts to resources are confined to the areas immediately around the abandoned mercury mine. All ground disturbing activities would occur within a 5-acre area of prior disturbance at the mine site.



There are no known past, present, or reasonably foreseeable future actions in the proposed project area that have been, are being, or will be taken by agencies or persons other than the BLM.

### **Past Actions**

The identifiable present effects of past actions result from the exploration and mining activities at the Bretz Mine and associated access roads. The two primary ore bodies of the Bretz Mine were exhausted by 1936. Records indicate that mercury mining and processing operations occurred at Bretz Mine from 1931 through 1968. The mining operations and associated access roads and processing areas have created 500 acres of surface disturbance. The surface disturbances have caused accelerated erosion of certain slopes.

The westernmost pit contains an intermittent pit lake. Excavation of the west pit is the potential cause of the slope failure at the north end of the mine site. The mercury retort processing area is a source of contaminated soil and equipment. The mine is considered to be an abandoned mine site and rehabilitation and reclamation has been requested by both Oregon Department of Environmental Quality and the U.S. Environmental Protection Agency.

### **Present Actions**

Within the geographic scope of this analysis, no known present actions by the BLM or other parties were in progress at the time this EA was written. No known actions would be occurring during the period of this proposed action. For this reason, there are no effects from present actions that have a cumulative relationship with the effects of this proposed action.

### **Reasonably Foreseeable Future Actions**

At the time this EA was written, the BLM had no planned or proposed projects within the geographic scope of this analysis other than the mine rehabilitation. Operations following the BMP's will minimize visual impacts and prevent any undue and unnecessary degradation of public land.

Vegetation in the immediate vicinity consists of shrub steppe plant communities dominated by sagebrush species and bunchgrasses. In the short-term the limited plant communities will be eliminated from the edge of the southern pit wall, but adherence to the BMP's and BLM reclamation standards will provide for reestablishment and potential enhancement of the native plant communities. The southern pit wall will be smoothed and contoured to resemble the surrounding topography and vegetated with a native seed mixture. The existing perimeter fence will be maintained until the native seed re-vegetation is established; anticipated to be two or more growing seasons.

The one special-status plant species, smooth wild cabbage (*Caulanthus crassicaulis* var. *graber*), is present in the vicinity of this rehabilitation site. Efforts will be made to minimize the disturbance of the plant community by limiting access on the south side of the pit to that necessary for the re-contour dozer work. Future rehabilitation efforts at Bretz Mine may affect special-status plants established on disturbed areas on the western edge of the mine area. Best management practices will be implemented to avoid significant disturbance of the community.



Sage grouse and pygmy rabbits are unlikely to be affected under the proposed alternative. Beneficial or detrimental effects to fish or other wildlife species, including mule deer, pronghorn antelope, and bighorn sheep would be relatively minor.

Overall, the natural conditions, outstanding opportunities for primitive and unconfined recreation, and supplemental values which are characteristics of wilderness values are currently absent at this site. No cultural or paleontological resources were located at the proposed project location.

During the rehabilitation process of the pit area, there would be relatively short term degradation of air quality until the re-contouring of the pit wall is complete. Some measure of air quality improvement should be realized in the long term under the proposed alternative. Stabilization of the pit area by re-contouring and re-vegetation with native plant species should provide an overall visual improvement to the area. Water quality would not be affected by this specific project but an overall improvement is anticipated as the remainder of the mine site is rehabilitated.

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## 10 References

BLM, 1979, Northern Malheur Management Framework Plan, Bureau of Land Management, Vale District Office, Vale, OR

BLM, 2002, Southeast Oregon Resource Management Plan and Record of Decision. Bureau of Land Management, Vale District Office, Vale, OR

BLM, 1992, BLM Manual Handbook 3042-1. Bureau of Land Management, Solid Minerals Reclamation Handbook, 104pp.

BLM, 2008, National Environmental Policy Act Handbook, BLM Handbook H-1790-1, January, 2008, Bureau of Land Management.



Brimlow, George F., *The Bannock Indian War of 1878*. Caldwell, Idaho: Caxton Printers.

Fowler, Catherine and, S. Liljebled, 1986, *Northern Paiute In Great Basin* edited by Warren L. D’Azevedo, pp.435-465. *Handbook of North American Indians, Volume 11* William G. Sturtevant, general editor. Smithsonian Institution, Washington.

Gregg, Jacob Ray, 1950, *Pioneer Days in Malheur County*, p. 443.

Intergovernmental Panel on Climate Change (IPCC). 2007a. *Climate Change 2007: Synthesis Report (Summary for Policymakers)*. Cambridge University Press. Cambridge, England and New York, New York. Available online at: [http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr\\_spm.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf) .

John, D.A., Wallace, A.R., Ponce D.A., Fleck, R.B., and Conrad, J.E., 2000, *New perspectives on the geology and origin of the northern Nevada Rift*, in Cluer, J.K., Price, J.G., Struhsacker, E.M., Hardyman, R.F., and Morris, C.L., eds., *Geology and Ore Deposits 2000: The Great Basin and Beyond: Geological Society of Nevada Symposium Proceedings*, May 15-18, 2000, p. 127-154.

Longtine, Mark, 2005, *Bretz Mine Investigation Summary Report*, prepared by Ecology and Environment Inc, for Oregon Department of Environmental Quality, 29 pgs.

NOAA 2005. National Oceanic & Atmospheric Administration, U.S. Department of Commerce. Climate information available on the internet at <http://www.noaa.gov>.

Orr, E.L. and Orr, W.N., 1999, *Geology of Oregon*, 5<sup>th</sup> Edition, 254 pgs.

Schuette, C.N., 1938, *Quicksilver in Oregon*, State of Oregon, Department of Geology and Mineral Industries, Bulletin Number 4, 169 pgs.

USDA 1994. USDA Soil Conservation Service (SCS), USDI Bureau of Land Management, and National Cooperative Soil Survey.

U.S. Environmental Protection Agency. 2008. “Climate Change – Science – State of Knowledge” webpage. Available online at: <http://www.epa.gov/climatechange/science/stateofknowledge.html> .

U.S. Environmental Protection Agency. 2003, *Bretz Mine Site Inspection Report*, 65 pgs.

U.S. Environmental Protection Agency. 2003, *Opalite Mine Site Inspection Report*, 55 pgs.

U.S. Environmental Protection Agency, 2005. U. S. Environmental Protection Agency. Region 10 Air Program information available on the internet at <http://epa.gov/region10/AIRPAGE.NSF/webpage/Air+Quality>.

Walker, George W., and MacLeod, Norman S, 1991, *Explanation for the Geologic Map of Oregon*, United States Geological Survey.



Whiting, Beatrice Blyth, 1950, Paiute Sorcery. Viking Fund Publications in Anthropology 15. New York.

WRCC 2007. Western Regional Climate Center. McDermitt, Nevada. Period of Record Monthly Climate Summary data available on the internet at <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?nv4935>

<http://www.answers.com/topic/malheur-county-oregon>

<http://ceq.eh.doe.gov/nepa/regs/ceq/1508.htm#1508.13>

<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ormcde>



## 11 Finding of No Significant Impact (FONSI)

The FONSI is a document that explains the reasons why an action will not have a significant effect on the human environment and why, therefore, an EIS will not be required (40 CFR 1508.13). This FONSI is a stand-alone document but is attached to the Environmental Assessment (EA) and incorporates the EA by reference. The FONSI does not constitute the authorizing document: the decision record is the authorizing document.

“Significance” as used in NEPA requires considerations of both context and intensity (40 CFR 1508.27).

For context, significance varies with the setting of the proposed action. For instance, for a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. For this proposed action, the effects are confined to the immediate area within the Cottonwood Creek and Little Cottonwood Creek drainages near where the abandoned mine is located. For this reason, the analysis of effects is in the context of these drainages. These effects are described and analyzed in the EA.

Intensity refers to the severity of effect. The BLM will conduct the actions described using the BMPs referenced in the EA and limiting effects to the immediate vicinity of the eastern pit.

The action being proposed is to rehabilitate a portion of the Bretz Mine, particularly, the southern pit wall of the eastern pit. This action is being proposed as a budgeted portion of the total site reclamation in order to meet BLM Abandoned Mine Land goals in a cost effective manner while preventing undue and unnecessary degradation of public land.

The Bretz Mine site has been specifically excluded from areas identified in any citizen’s proposal as possessing wilderness characteristics. Additionally, about 1,700 acres surrounding and including the Bretz Mine site has been excluded from BLM wilderness characteristics units. BLM has evaluated this area and has determined minimal impact will occur by the proposed action. BLM anticipates an overall improvement to the area by removing mine-related physical hazards and increasing the area of native vegetation.

Any land management action involving ground disturbance invariably, and by definition, entails environmental effects. I have determined, based upon the analysis of environmental impacts contained in the referenced EA (OR-030-08-006), that the potential impacts resulting from the proposed action would not be significant and that, therefore, preparation of an environmental impact statement is not required.

I find that the project’s affected region is localized and the effects of implementation are relevant to compliance with Federal and Oregon State law. There would be no adverse societal or regional impacts and no significant adverse impacts to the environment. I have evaluated the environmental effects, together with the proposed mitigating measures, against the tests of significance found at 40 CFR 1508.27. Although not a condition of my determination, implementation of all BMPs of the proposed project to protect native species and water quality during the rehabilitation effort at Bretz Mine would be critical to the success of the action.

I have determined that if the decision were made to implement the proposed action:



1. The proposed action would cause no significant impacts, either beneficial or adverse; all impacts would be insignificant; and the proposed activity will not have an adverse effect on water quality.
2. The proposed action would have no adverse effect on public health or safety. The goal of this project is to enhance public safety for the recreating public.
3. The proposed action would not affect unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, or ecologically critical areas.
4. The proposed action would have no highly controversial effects. The BLM believes this is the best action to satisfy the purpose and need for the rehabilitation of the Bretz Mine while conforming to the rules and regulations governing the administration of public lands.
5. The proposed action would have no uncertain effects and would not involve unique or unknown risks.
6. The proposed action is not related to any immediate action being considered by BLM. However, should Federal funding become available in the future, BLM's intent is to conduct additional rehabilitation on the western areas of the Bretz Mine. Prior to removal of hazardous materials an engineering economic cost analysis will be completed as per guidance within the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA [Superfund]) and Superfund Amendments and Reauthorization Act (SARA).
7. The proposed action would have no adverse effect to any property listed on or potentially eligible for listing on the National Register of Historic Places.
9. The proposed action would not significantly adversely affect an endangered or threatened species, or any habitat critical to an endangered or threatened species because BMPs would be utilized.
10. The proposed action does not violate any law or requirement imposed for the protection of the environment.
11. The proposed action would have a beneficial effect for the water quality by minimizing sediment laden storm run-off to local drainages. Additionally, air quality could be improved by reducing dust excursions from the disturbed portion of eastern pit and increasing the coverage of native vegetation.
12. The proposed action would not significantly adversely affect permitted livestock grazing.
13. The proposed action would not adversely affect wild horses or wildlife because adequate sources of forage and water will remain available.



This proposed action is consistent with the Southern Malheur Management Framework Plan (1983), the Southeastern Oregon Resource Management Plan/Final Environmental Impact Statement (1998) and Oregon State law.

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Carolyn R. Freeborn  
Jordan Field Manager  
Vale District BLM

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Date

