High Bar Placer Group (OR-63719) and Upper/Lower Pine Creek Mining (OR-60224) Environmental Analysis

Environmental Assessment V050-2013-010-EA

Prepared by:
U.S. Department of the Interior
Bureau of Land Management
Baker Resource Area
3285 11th Street
Baker City, Oregon 97814

Information Contact:
Margaret Doolittle
Baker Field Office
P.O. Box 947
Baker City, OR 97814
541-523-1256

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

DOCUMENT NUMBER

TABLE OF CONTENTS

1.0 INTRODUCTION
1.1 Background 1
1.2 Purpose and Need for Action 2
1.3 Current Operations 3
1.4 Decision to be Made 3
1.5 Issues and Critical Elements 3
1.6 Conformance to Laws and Regulations 5

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES
2.1 PROPOSED ACTION (Alternative #1)
a. Access/Roads 6
b. Mining and Placer Equipment 7
c. Buildings and Facilities 8
d. Schedule of Operations 8
e. Water Supply 9
f. Water/Sediment Management 9
g. Existing Disturbances 11
h. Mining Disturbance 12
i. Spill Prevention, Containment, and Countermeasures 14
j. Quality Assurance Plan 14
k. Reclamation Plan 14
l. Environmental Protection Measures 16

2.2 ALTERNATIVE TO THE PROPOSED ACTION (Alternative #2)
a. Access/Roads 18
b. Mining and Placer Equipment 18
c. Buildings and Facilities 19
d. Schedule of Operations 19
e. Water Supply 19
f. Water/Sediment Management 19
g. Existing Disturbances 20
h. Mining Disturbance 20
i. Spill Prevention, Containment, and Countermeasures 21
j. Quality Assurance Plan 21
k. Reclamation Plan 21
l. Environmental Protection Measures 21

2.3 NO ACTION ALTERNATIVE (Alternative #3)
a. Description of the No Action Alternative 23

2.4 ALTERNATIVE COMPARISON
a. Comparison of all Alternatives 23

3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT
3.1 EXISTING ENVIRONMENT
a. Air and Atmospheric Values 25
b. Cultural and Historical Resources 25
c. Resources of Importance to Native American Tribes 29

d. Noxious and Non-Native Invasive Plants 30
e. Water Resources 31
f. Vegetation and Botany 39
g. Geology and Mineral Resources 40
h. Soils 41
i. Range Management 41
j. Wildlife and Special Status Species 42
k. Fisheries and Fish Habitat 47
l. Visual Resources and Recreation 48
m. Socioeconomic Resources 49
n. Human Health and Safety-Hazardous Materials 49

4.0 ENVIRONMENTAL CONSEQUENCES
4.1 CRITICAL ELEMENTS CONSIDERED BUT NOT FURTHER EVALUATED
a. Critical Elements Considered 50

4.2 PROPOSED ACTION (Alternative #1)
a. Cultural and Historical Resources 52
b. Resources of Importance to Native American Tribes 53
c. Noxious and Non-Native Invasive Plants 55
d. Water Resources 58
e. Soils 61
f. Wildlife and Special Status Species 62
g. Socioeconomic Resources 63

4.2 ALTERNATIVE TO THE PROPOSED ACTION (Alternative #2)
a. Cultural and Historical Resources 63
b. Resources of Importance to Native American Tribes 64
c. Noxious and Non-Native Invasive Plants 64
d. Water Resources 65
e. Soils 65
f. Wildlife and Special Status Species 66
g. Socioeconomic Resources 66

4.3 NO ACTION ALTERNATIVE (Alternative #3)
a. Cultural and Historical Resources 66
b. Resources of Importance to Native American Tribes 67
c. Noxious and Non-Native Invasive Plants 67
d. Water Resources 68
e. Soils 68
f. Wildlife and Special Status Species 68
g. Socioeconomic Resources 69

4.4 CUMULATIVE IMPACT ANALYSIS INCLUDING PAST, PRESENT, AND FUTURE ACTIONS
a. Evaluation of Potential Cumulative Impacts 70
b. Unavoidable Adverse Effects 74
c. Relationship of Short-Term Uses and Long-Term Productivity 74
d. Irreversible and Irretrievable Commitments of Resources 75
e. Potential Conflicts with Plans and Policies of Other Agencies 75
f. Energy Requirements 75

5.0 CONSULTATION AND COORDINATION
5.1 Agencies Consulted 75
5.2 Interdisciplinary Team Members 75

6.0 REFERENCES
a. Wildlife and Fisheries
b. Geology and Soils
c. Cultural and Historical
d. Water Resources
e. Noxious and Non-Native Invasive Plants
f. Other Resources Evaluated

LIST OF TABLES

Table 1: Critical Elements of the Human Environment *(page 4)*
Table 2: Comparisons of All Alternatives for Pine Creek Environmental Assessment *(page 24)*
Table 3: Hydrologic unit levels, divisions, names, codes, and square mileage for drainages within the project area *(page 31)*
Table 4: Water Use Information for Pine Creek from Water Rights - listed in order by POD from upstream to downstream *(page 35)*
Table 5. Estimated Water Use for Water Developments Listed in Table 20d and the Effect of Water Use on Pine Creek *(page 36)*
Table 6. Proper Functioning Condition (PFC) ratings in Brannon Gulch and Pine Creek stream reaches within the project area by Bliss Enterprises LLC in 2011 *(page 37)*
Table 7. Wildlife of management importance according to season of use and key habitat characteristics *(page 44)*

LIST OF FIGURES

Figure 1: Vicinity Map *(page 2)*
Figure 2: Brannon Gulch 7.5 minute Quadrangle

APPENDICES

Appendix A: Maps of the project area (21 pages)
Appendix B: Spill Prevention, Containment, and Countermeasures Plan for all Operations (3 pages)
Appendix C: Botanical Evaluations for both OR-63719 and OR-60224 (12 pages)
Appendix D: Soil tables and Maps (16 pages)
Appendix E: Sage-Grouse Habitat Mitigation Plan (5 pages)
Appendix F: Response to Comments Received During Comment Period March 20-April 19, 2013 (10 pages)

ENVIRONMENTAL ASSESSMENT FOR OR60224 & OR63719 ON PINE CREEK

High Bar Mining LLC Placer Project

1.0 INTRODUCTION

1.1 Background

This Environmental Assessment (EA) is a site specific analysis undertaken by the Bureau of Land Management (BLM) Baker Field Office of the proposed action and alternatives including no action taking place on public lands. The proposed action is created from mining Plans of Operation (Plans) submitted pursuant to Title 43 Code of Federal Regulations (43 C.F.R.) 3809: High Bar Placer Group (BLM Serial Number OR-63719) and Upper and Lower Pine Creek Mining (OR-60224) located on upper Pine Creek, Brannon Gulch, and Reeds Gulch in the Baker Resource Area. The proponent for this action is High Bar Mining LLC. The EA is in conformance with, and tiered to, the 1986 Proposed Baker Resource Management Plan (RMP) Environmental Impact Statement (EIS), and the 1989 Baker Resource Management Plan Record of Decision (ROD). These documents are available for review at the Baker Field Office in Baker City, Oregon.

These two Plans include an area covered by unpatented placer mining claims located in T. 12 S., R. 39 E., Sections 14, 15, 22, 23, 26 and 27 (see claim maps in Appendix A pages 1 & 2) and will be referred to as the project area for the rest of this document. The lands covered by the claims are administered by the BLM and are open to public entry under the general land and mineral laws as public domain lands

(http://www.blm.gov/or/landrecords/survey/ySrvy2.php?tr=120S390E&srt=A&ti=25&ri=52&ln=0000000).

These Plans have been combined under one operator since High Bar Mining LLC has acquired all of these claims recently from two separate operators. The project area combines these two Plans for the ease of evaluation and the adjacent vicinity of the two proposals. The past, present, and future actions as well as cumulative effects more efficiently analyzed together instead of separately.

The Vicinity map on the next page shows the project area in relation to Baker City, Oregon. This map also includes BLM administered lands in yellow and Forest Service administered lands in green for reference.

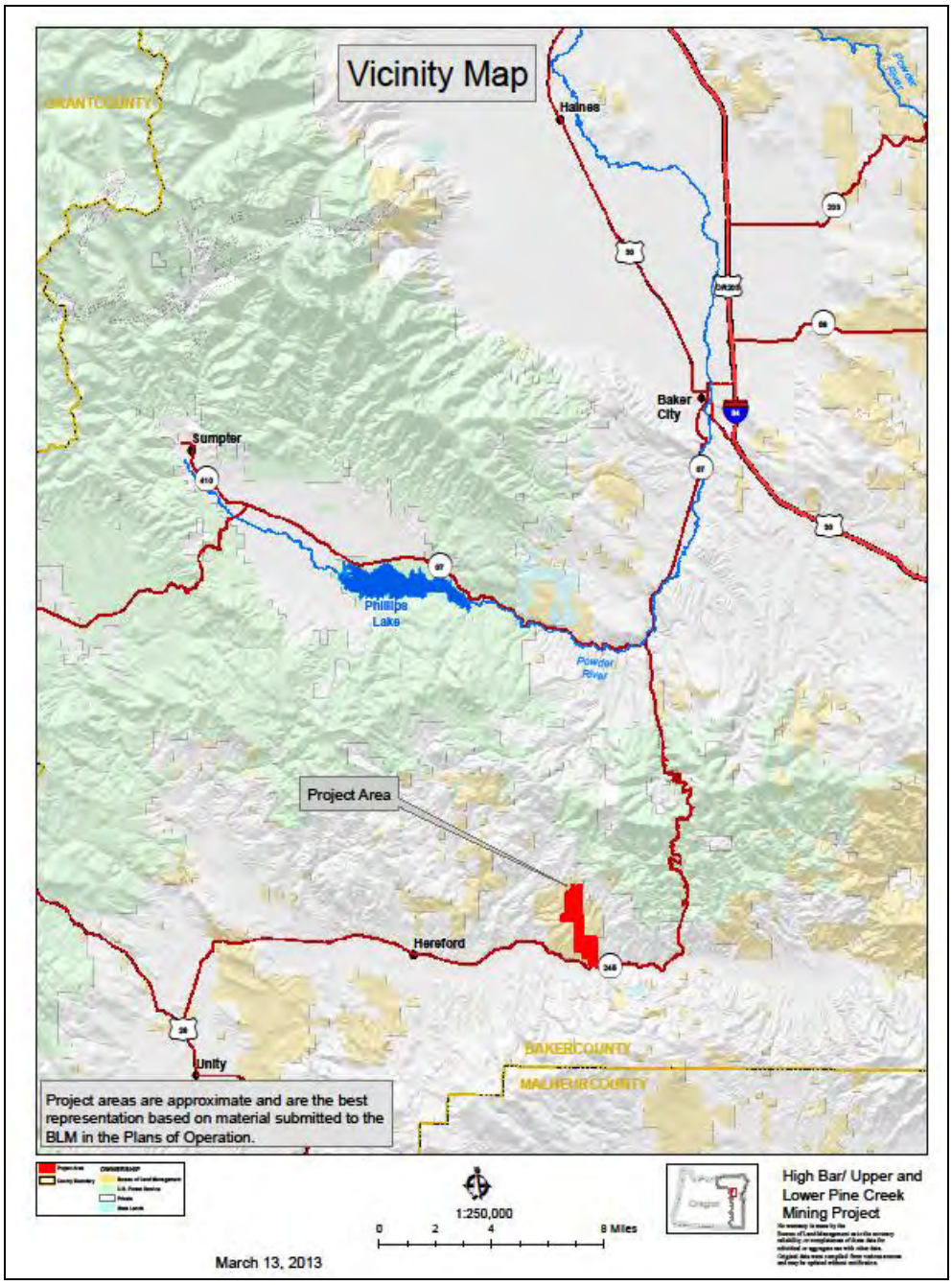


Figure 1: Vicinity Map

1.2 Purpose and Need for Action

These mining Plans are located within a designated Active Mining and Development Area, Pine Creek Minerals Priority Management Area, of the Baker Resource Management Area (Baker RMP, 1989). Locatable minerals resource development falls within the requirements of 43 C.F.R. 3809 Surface Management regulations, the Mining Law of 1872, the Federal Land Policy and Management Act of 1976 (FLPMA), the Multiple Surface Use Act of 1955 (or PLO 167), and the Mining and Minerals Policy Act of 1970. These laws entitle the public the right to prospect, mine, and sell certain federally owned minerals on federally managed public lands

open to mineral entry while ensuring that the prospecting and mining activities do not cause unnecessary or undue degradation of public lands and resources. The BLM is directed by the Surface Management regulations to review proposed Plans on BLM administered public lands for content completeness and to complete an environmental review as required under the National Environmental Policy Act (NEPA). The mining Plans would allow the proponent to move from exploration or notice-level to development and production or plan-level operations as required by 43 C.F.R. 3809.

1.3 Current Operations

Pursuant to 43 C.F.R. 3809 there are existing operations occurring within the project area (see Appendix A, page 5). The operator is operating under three separate Notices pursuant to 43 C.F.R. 3809 and would continue to work at this level under Alternative #3. The operations are currently approved under an Oregon Department of Geology and Mineral Industries (DOGAMI) permit for disturbance over 1 acre or 1,000 cubic yards annually and an Individual Water Pollution Control Facility (WPCF) permit from the Oregon Department of Environmental Quality (ODEQ). Under the Notices, mining areas will be explored in ½-¾ acre parcels to depths up to 50 feet. Water is provided by pipelines from two wells and directly from Pine Creek. Existing roads are being utilized and a pipeline from south to north has been installed for water transport from the wells. Large mining equipment is being utilized to excavate and clear areas for placer exploration and concurrent reclamation is occurring. A financial guarantee for reclamation of activities described in each Notice was calculated and entered prior to starting operations. Operations are qualified as a notice-level by: using mechanized equipment, less than 5 acres of disturbance, not extracting minerals for commercial use or sale, and not in any National Wild and Scenic River Systems, Area of Critical Environmental Concern, National Wilderness Preservation System lands, National Monuments, or National Conservation Areas.

Historically this area was mined and has many placer tailings close to Pine Creek along with other signs of previous operations such as open adits, old buildings and ditches. All historical areas have been avoided, but have been inactive for many years allowing vegetation to reestablish in many areas.

1.4 Decision to be made

The BLM has written this environmental analysis pursuant to the NEPA. This document includes the review of a proposed action, as submitted by the proponent in the form of two Plans and a range of alternatives including a no action alternative; which would allow notice-level operations to continue in compliance of 43 C.F.R. 3809. Through this document the BLM will determine whether the alternatives may have significant impacts to the human environment as well as the surface resources and how the operations would proceed to eliminate undue and unnecessary degradation of public lands.

1.5 Issues and Critical Elements

Species of concern in the Pine Creek area include Greater Sage-Grouse and Columbia spotted frog (DOI IM OR-2008-038). These two species have been observed in the area and while neither is protected under Endangered Species Act of 1973 (ESA), two surveys were conducted in 2011 that documented general and special status wildlife species within the project area. Greater Sage-Grouse is a candidate species for listing under ESA (75 FR 13910) in 2015 by US

Fish and Wildlife Service (USFWS). This EA evaluates measures to minimize negative effects to these two species from mining operations.

Water quality and use may become an issue if this operation isn't designed, implemented, and monitored correctly. The groundwater being utilized for mining could create a lower water table by pumping large amounts of water from the groundwater system. There has been an internal BLM study done to identify riparian areas, based on soil type and vegetation, within the project boundary in order to ensure they are protected (Nieves, 2011).

Other issues associated with this proposal include those identified in the 1989 Baker RMP, Chapter 2 and identified as critical human environment elements that could be affected by this action.

Specifically, there are 24 Critical Elements potentially affecting the Human Environment that are required to be analyzed in the EA (Table 1). This table summarizes those elements which are present in the project area and those which are affected by the activities described in the alternatives. The existing environment will address elements which are present within the project area, but may not be addressed further due to lack of effects from the project activities.

Table 1: Critical Elements of the Human Environment (*Italics indicate resources addressed in the Existing Environment section)*

Critical Element	Present	Affected	Critical Element	Present	Affected
Air Quality	*Yes*	*Yes*	*T, E, S species (plants, fish, and wildlife)*	*No*	*No*
Areas of Critical Environmental Concern (ACEC)	No	No	*Tribal Concerns and Treaty Rights*	*Yes*	*Yes*
Cultural Resources	*Yes*	*Yes*	*Special Status Species (wildlife)*	*Yes*	*Yes*
Energy and Mineral Resources	*No*	*No*	*Wastes, Hazardous materials*	*Yes*	*Yes*
Environmental Justice	No	No	*Water Quality, surface/ground*	*Yes*	*Yes*
Farmlands	No	No	*Wetlands/Riparian Zones*	*Yes*	*No*
Floodplains	Yes	No	Wild and Scenic Rivers	No	No
Forestry	Yes	No	Wilderness/WSA/LWC*	No	No
Noxious and Non-Native Invasive Plants	*Yes*	*Yes*	Wild Horse and Burros	No	No
Migratory Birds	*Yes*	*Yes*	*Recreation*	*Yes*	*No*
Soils	*Yes*	*Yes*	Paleontology	No	No
Visual Resources	*Yes*	*No*	*Access/Transportation*	*Yes*	*No*

*WSA = Wilderness Study Areas, LWC = Lands with Wilderness Characteristics

In addition to the above Critical Elements listed in Table 1, the following other resources are present and are addressed in the Existing Environment section.

Socioeconomics Resources	*Range Management*
Geology	*Human Health and Safety*

1.6 Conformance to Laws and Regulations

The three alternatives described below are in conformance with the goals for mineral resources of the Baker Resource Management Plan (RMP) and Record of Decision (BLM 1989). The project area is located within the Baker County Miscellaneous Geographic Unit (GU) of the Baker Resource Area (RA). Major resources identified for the GU include minerals, forest, and wildlife; minor resources include range, watershed, recreation, and cultural. The locatable minerals objective for the Baker RA is to allow exploration and development on 392,222 acres of public domain lands available for location under the locatable mining laws (BLM, 1989, p. 28). This exploration and development would be consistent with the "unnecessary or undue degradation" standard set forth in Surface Management Regulations (43 C.F.R. 3809) and the Federal Land and Policy Management Act of 1976 (FLPMA).

Both Plans were submitted and considered complete under the 43 C.F.R. 3809 requirements. The Mining Law of 1872 as amended allows public lands owned by the United States to be open to mineral exploration as public domain lands, which does not include withdrawn areas or acquired lands. All applicable claims have been filed according to the FLPMA and are on lands determined to be open to mineral entry.

Operations would be in accordance with all Federal, state, and local laws and regulations. Operations would not start until all approved permits are provided to the BLM. State, local and other federal departments may include but are not limited to: Oregon Department of State Lands (DSL), DOGAMI, DEQ, Oregon Water Resources Department, USFWS, and U.S. Army Corps of Engineers (ACE).

There were six letters submitted during the 30 day comment period. The comments and responses can be viewed in Appendix E. None of the comments substantially changed the evaluation of the proposed action or alternatives.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action (Alternative #1)

The proponents filed two Plans, High Bar Placer Group (OR-63719) located in T. 12 S., R. 39 E., sec. 10 &15, W.M. and Upper/ Lower Pine Creek Mining (OR-60224) located in T. 12 S., R. 39 E., sec. 26 & 27, W.M. These two Plans have been separated into the ridge top and the Pine Creek valley bottom for ease of evaluation. Driving access to the project area is north off of Highway 245 eight miles east Hereford, Oregon. The proponents propose to mine gold-bearing placer gravels through operations in areas along Pine Creek and on the ridge between Brannon Gulch and Pine Creek drainage. The proponents are currently exploring the mineral deposit under notice-level operations on both the ridge top and in the valley bottom (see Appendix A page 3).

Maximum area of disturbance for the Upper and Lower Pine Creek Plan would be approximately 30 acres of area within the Pine Creek valley bottom including mining sites, processing sites and identified access routes. The area of disturbance for the High Bar Plan would be approximately 217 acres including minimal exiting work in the Pine Creek valley bottom. The total proposed disturbance can be viewed on the Alternative #1 map in Appendix A on page 3.

As operations commence, starting on the ridge to the west of the Pine Creek, the material would be hauled to the processing sites and run through a wash plant. These operations would proceed in five acre parcels from north to south along the ridge. As each five acre parcel is opened, the previous one would be reclaimed by filling holes in with washed gravels with topsoil replaced on the top. Sediments would be cleaned out of the ponds and set aside to dry then used for growth medium in reclamation.

The mine would employ eight workers, five days a week on two ten hour shifts. Proposed processing rate is 3,000 cubic yards of material per shift. Operations would continue year round, except when freezing temperatures may require short periods of closure. An estimated 130 days of work would be scheduled per year. The operator is estimating 15-20 years of work on this site.

The current notice-level operations for both High Bar & Upper and Lower Pine Creek are bonded according to the magnitude of the disturbance, which currently is 5 acres for each, totaling 15 acres. These bond amounts would be reevaluated for Plan activities prior to operations pursuant to 43 CFR 3809.552(b) and (c). The following permits are required prior to work and may need to be expanded for Plan level activities: a water rights permit from the Oregon Water Resources Department for the water supply, a Water Pollution Control Facility (WPCF) permit from the ODEQ for the settling ponds, and an operating permit from DOGAMI for disturbance over 1 acre or 10,000 cubic yards annually. These permits will be maintained for all operations on this site and copies will be provided to the BLM prior to starting operations.

The proposed action described in two Plans is supported by the locatable mineral values determined by previous testing and ongoing exploration by the operators. The proposed action is to mine the project areas until values are exhausted using equipment such as excavators, bulldozers, loaders, and dump trucks for extraction of material. Processing of the material would use pumps, a blade mill, conveyors, large washing plants, and pipelines. All activities are proposed under the authority of the 1872 Mining Law as amended and the BLM Surface Management regulations located at 43 C.F.R. 3809. The details of both Plans are included below, combined into the proposed action. The project area includes two defined topographic features: the ridge top (High Bar Plan area) and the Pine Creek valley bottom.

a. Access/Roads (see Appendix A, pages 2, 6 & 7): Access to all claims is from Highway 245 traveling north along the Pine Creek County road 731 (labeled as Bald Mountain Mine Rd) about 3.6 miles on the east side of Pine Creek. Access to the west side of the claims is from Reeds Creek and Brannon Gulch roads. A mine access road along the bottom of Pine Creek (pipeline road) was reopened in 2011 for ATV maintenance access along the pipeline. It is 1.2 miles long (6,336 feet) and runs from well #2 on the Upper/Lower Pine Creek claims up to well #1 on Processing Site #5. This road would be

widened during operations at Mining Site #7. The drill rigs also created an additional 0.2 miles (1,056 feet) of road for access for drilling the wells at Processing Site #5. Both of these roads have been gated with metal Powder River type gates. The pipeline road would only be used by ATVs for maintenance until mining starts in the Pine Creek canyon. All claims would have a limited amount of cross country travel associated with access to mining sites and would be completely reclaimed with the mining area. Hauling would be done along main roads and signed for public safety. All roads proposed in the Plans would be 18 feet wide on average including berms required by Mining Safety and Health Administration (MSHA). The road that crosses Pine Creek just below the dam on the transfer pond would have about 200 feet of road reconstructed for additional access to Processing Site #5. Maintenance of mine access roads would include blading and installation of drainage features such as water bars or culverts where necessary. All maintenance of the county roads by the operator would be coordinated with the Baker County Road Master. Gates are proposed for roads which lead only to the mining areas for public and operator safety.

There are about 10,000 feet of existing and temporary roads across all current mining and processing areas which are used for mining access. All access roads expanded and created for mining use would be reclaimed to previous conditions or closed if not on BLM inventory.

b. Mining and Placer Equipment:

Equipment proposed for use in mining and processing operations for both Plans is listed below. The equipment may change if needed. The operator would notify the BLM in writing if there is a change to any equipment listed in the Plan.

- 2-Kawasaki loaders with 7 cubic yard buckets
- 1-Hitachi excavator
- 1-John Deere 330 excavator
- 1-D10 Caterpillar bulldozer
- 1-D8 Caterpillar bulldozer
- 1-skid steer loader
- 1-jaw crusher
- 1-40 ton Caterpillar haul truck
- 1-30 ton Terex haul truck
- 2-conveyors per stationary processing site
- 1-mobile wash plant-3,000 cubic yards per day washing plants
- 2-stationary wash plants-1 at Processing Site #5 and one at Processing Site #6
- 1-blade mill
- 1-tractor
- 1-double axel equipment trailer
- sluices
- 4-pumps
- welders
- 2-generators

- 1-pipeline (6600'-6" Viclock aluminum from well #2 to well #1, 5800'-6" aluminum transfer pond to Site #2, and 2600'-4" aluminum from BLM boundary to Processing Site #2)
- 4 x 4 pickup trucks
- 1-service truck
- 1-water tender
- 1-sand screw

c. Buildings and Facilities:

The proposed buildings and facilities include a temporary wooden or metal pump house on well #2 sized 8' x 12' x 8' to protect the equipment pumping water uphill to the transfer pond. On Processing Site #1, within the bermed area, there would be 2 Conex trailers, sized 40' x 8' x 8' for storage of smaller mining related equipment and a shop trailer which is a semi-trailer 40' in length for work on small equipment and store tools. Outside the fenced area at Processing Site #2 on High Bar ridge, a safety trailer would be set up for public and employee safety review and check in. Next to the safety trailer, a watchman's trailer would be set up for security. Chemical toilets would be placed in convenient and safe locations throughout the operations for use by employees.

A heavy plastic lined containment vault with earthen berms designed to hold 11,110 gallons of fuel would be on site under and around a double lined 10,000 gallon, above ground fuel tank. This containment vault would also be built to withstand the full volume of fuel and precipitation from a 100-year, 24 hour storm event. Fuel would be used to support all diesel equipment on site. The fuel storage area would disturb approximately 0.55 acres.

These buildings and facilities are in compliance with 43 C.F.R. 3715 in regards to occupancy. The temporary structures are: incident to mining, constitute substantially regular work, would lead to the extraction and beneficiation of minerals, would support visible on the ground mining activity, and use appropriate equipment that is operable. All occupancy by watchmen on site would be to protect the minerals and equipment from theft, protecting the public from mining activities and equipment, and not in an area within the mining boundary. All buildings and facilities would be bonded for and removed once mining is complete.

d. Schedule of Operations

High Bar Mining LLC has proposed that operations would last 15-20 years. The majority of the reclamation and earthwork would take place concurrently with active mining operations as sites are exhausted; requiring a year at a minimum for final reclamation including removal of equipment, recontouring, and seeding once mining is completed. Much of the seeding would take place as the operations move down the ridge and downstream along Pine Creek to provide for optimum vegetation establishment.

The operator plans to mine in 5 acre parcels, with up to 3 parcels during a mining season, creating 15 acres of disturbance annually. This seasonal disturbance may change

throughout the project depending on the ability to process 3,000 cubic yards per shift, working equipment, and values found while mining.

All equipment and facilities would be removed from the area during final reclamation. Roads would be closed by decommissioning or stabilized depending on pre-mining uses. Final reclamation would take place in the season following the completion of 247 acres of mining. If all operations proceed as planned, then final reclamation including seeding, should take place around year seventeen.

Vegetation monitoring would occur after the completion of reclamation to determine if vegetation becomes re-established in the area.

e. Water Supply

Water is supplied from two wells in the Pine Creek valley bottom and a gravity fed pipeline from Pine Creek on U.S. Forest Service managed land to the north. All water would be recycled on each processing site in a series of sediment settling ponds. All pipelines are above ground and made of 4-6" Viclock heavy walled aluminum pipe. The entire 12,500 foot length (on BLM lands) of both pipelines is accessible for maintenance by ATV roads.

Water for the main Processing Site #2 would be supplied by pipelines; one is gravity fed from the National Forest System lands and the other is pumped from the Transfer pond on Processing Site #4. The Transfer pond is fed via pipeline from two wells, put in place for mining purposes and cleared by permits from the county and the state. The pipeline off the Forest Service exists and provides 0.5 cubic feet per second (cfs) to the operation during the spring months. The clean water pond on Processing Site #2 would hold the water pumped from Pine Creek and the wells in the valley bottom is sized approximately 120' x 60' x 10' and has been lined to prevent seepage.

Pumps, hoses, and generators associated with water supply would be stored on site and be maintained on a daily basis.

f. Water/Sediment Management

The proposed action calls for a total of 6 processing sites in order to help with water sediment management (see pages 8 & 13 of Appendix A). They would be numbered and described in order from north to south, 3 of them are on the ridge and 3 in the Pine Creek valley bottom. Two of the proposed sites are larger in size due to the greater amount of material processed on them. The other 4 processing sites will be used to cut hauling times and for smaller amounts of material. All ponds would be created off channel on these sites. The processing sites would be backfilled and reseeded once mining in the area is completed. The majority of the water supplied for this project is directly pumped from the two wells put in place in the valley bottom through the Transfer pond. There may be some ground water source tapped during operations which would be pumped out of the mining hole and used for processing.

Ponds would be used to settle out sediments and make water available to recycle through the processing system. Most of the processing sites have a 3 pond system with the first pond being cleaned out of sediments daily during operations. Processing Sites #1, #3, #4, and #6 will be no larger than 1.5 acre total, Processing Site #2 is proposed to be 4.5 acres, and Processing Site #5 is going to be approximately 5 acres. All processing areas except the small test Processing Site #4 would have temporary fences of hog wire and metal posts with berms around them.

Processing Site #1 is the currently established processing site on High Bar ridge (see Appendix A, page 9). Recently the equipment from the previous operator has been removed and the area reclaimed by backfilling the excavations and seeding. The total disturbance of this site is currently estimated at 1.5 acres including access roads and seeded areas. The proposed sediment trap pond is at 20' x 20' x 8' and 4 settling ponds at 40' x 200' x 8' would be replacing the 2 settling ponds reclaimed recently. There would be a sediment drying area on this site which is a 100' x 200' x 6' sized stockpile which will be expanded to several acres as mining progresses. This processing site would be reclaimed once mining on the north end of the claims is finished and the processing would be moved to Processing Site #2 and then progressively to Processing Site #3.

Processing Site #2 is the proposed stationary processing site to be utilized for the duration of operations (see Appendix A, page 10). The ponds on the site would have an earthen berm surrounding it and would be fenced with hog wire and metal posts The entire site would have a berm around it to prevent water from getting outside the processing area. The sediment trap pond, the first pond down from the wash plant, would be 20' x 20' x 8' and continuously cleaned out as material is processed. The wet sediments from the bottom of the first pond would be put in a shallow sloped pile in a holding area west of the settling ponds. The 3 settling ponds used for circulating water would each be approximately 300' x 30' x 8'. There would be water leaving the third pond in a gravity fed pipeline and water supplied will be pumped to the first of the settling ponds through a pipeline. This processing site is at the top of a ridge and is about 1,000 feet away from the Pine Creek channel.

Processing Site #3 would be approximately 1 acre in size and located on the Brannon Extension claim for processing on the south end of proposed mining on the ridge (see Appendix A, page 11). There would be 1 sediment trap pond at this location approximately 20' x 20' x 8' and the water from Processing Site #2 would be transported by gravity to this site to use in the washing plant and then would be pumped back to site #2 from the sediment trap pond.

Processing Site #4 is the first proposed stationary site in the valley bottom (see Appendix A, page 12). Unlike the mobile sites, this site would have a U-shaped pond approximately 10' x 80' x 5' and would only be used for small test runs of pay dirt. Water for processing on this site would be supplied from the well pipeline being pumped north. This site would have a footprint of approximately ½ acre.

Processing Site #5 would be approximately 5 acres and process about 500 cubic yards a day (see Appendix A, page 14). The transfer pond sized 200' x 60' x 10' would store water from both wells. Settling ponds would be sized as follows: a sediment trap pond 20' x 20' x 5' for thick sediments which would be cleaned out daily, and 3 settling ponds each sized 200' x 30' x 8' and created after mining in the area has been completed. All settling ponds would be surrounded with berms to prevent overflow.

Processing Site #6 would be approximately 1 acre in size and will be able to process up to 300 cubic yards of material a day (see Appendix A, page 15). The 3 settling ponds on this processing site would be considerably smaller at 20' x 30' x 6' and would incorporate the 2 existing ponds. This site is where the pipeline would start and pump water uphill to the transfer pond to provide water for all operations.

Water quality is expected to be maintained by allowing the solids to settle into the tailings settling ponds before the water is reused. Water seepage from the settling ponds into the surrounding soils is anticipated and permitted by the state.

Sediments from the ponds would be dried and replaced on top of washed and separated backfill material to provide a growth medium for vegetation. Sediments would be cleaned out of settling ponds on a regular basis to provide for the ongoing reclamation needs.

g. Existing Disturbances

As in any operation, the operator must establish a cause for expanding the operations. In this case, there have been extensive test runs throughout the last 20 years throughout the whole project area under Notices. Therefore, an existing footprint of 15 acres of disturbance across the project area exists (see Appendix A, page 5).

The current operations are small scale, mining in ½ - ¾ acre increments to a depth of 30 feet on the ridge top. On the valley bottom the notice includes sampling, testing and establishing two wells in addition to the exploration in ½ - ¾ acre parcels to a depth of 50 feet. No mining directly in the Pine Creek channel is included in any of the Notices. Operations include: use of existing processing sites containing 3 settling ponds, a ⅓ acre mining area, and water use under existing water rights. Two processing sites are currently operational and being used for processing (Processing Site #5 for Upper/Lower Pine Creek and Processing Site #2 on High Bar). Processing Site #5 is currently not more than one acre and Processing Site #2 has been constructed under a Notice and is 4.5 acres. Notice-level operations allow up to 5 acres or 1,000 cubic yards of presumed ore material to be mined annually for exploration under the 43 CFR 3809 regulations. Much of the work described in these Notices has been completed for this project area.

A 12,600 foot pipeline has been established under a Notice with a maintenance road going from well #2 to well #1. The road and pipeline are parallel to each other up the canyon and have been estimated at 6,336 feet. The road is 10' wide with 2 culverts, which were installed and will be used by ATVs to maintain the pipeline until access to the canyon is needed for mining.

For the purposes of these Plans of Operation and Reclamation Plans, all activities conducted by the proponent from authorization by the Field Manager will be considered new disturbances subject to reclamation requirements for Plans. Not all of the Notice work on either site has been reclaimed, but will be dealt with as per each Notice.

h. Mining Disturbance

The Plans have been combined as the project area, totaling 247 acres of disturbance. This proposed acreage would include mining on the ridge and mining in as well as in and along the Pine Creek channel (see Appendix A, pages 3). The mining would occur in 5 acre parcels with up to 15 acres mined in a season, running from the north to south on the ridge first, then north to south in the valley bottom along Pine Creek. Many of the mining sites on the southern end have rather small acreage, and parcels are isolated from each other.

All mining areas would be stripped of vegetation in the fall or winter to protect ground nesting birds in the spring. There would be excavations up to 5 acres open at a given time, with 3 parcels opened per season with additional disturbance area for stockpiles of topsoil and overburden. Mining would proceed similarly in all sites by stripping topsoil into stockpiles, piling overburden separately, and processing the pay dirt along bedrock at a depth of 30-60 feet.

Mining Site #1(see Appendix A): Mining would start here and the existing pit will be expanded from ½ acre to five acres which has already been cleared of vegetation. The entire Mining Site #1 will include 38 acres north of the current Processing Site #1. Bedrock is estimated to be 10-30 feet deep in this location and the proposal is to mine to the depth of bedrock. Equipment would access this depth via a temporary ramp built on the south end of the pit, which would be moved as mining progresses north (see Appendix A, page 18). Mining will take place from Processing Site #1 around and to the north. (see Appendix A, pages 2 & 16).

Mining Site #2 (see Appendix A, page 16): This 171 acre site would be opened after reclamation is completed to BLM standards for Processing Site #1 and Mining Site #1. The proposal indicates starting at Processing Site #2 and working north to the reclaimed Mining Site #1, then working south to the southern boundaries of Brannon Extension and High Bar Extension claims. Processing Site #3 will be established when haul times to Processing Site #2 get too long.

Mining Site #3(see Appendix A, page 16): Operations on Mining Site #3 are proposed in and along the Pine Creek channel. This mining site has been separated into 3 segments: 3a, 3b, and 3c. All mining in these locations will take place in the late fall when water is at the lowest level. The mining would start at the southernmost proposed area and continue northward to the northernmost boundary of the claims. Each segment would be approximately 500’ x 50-80’ x 20’. The proposal covers the channel as well as gravel bars beside the channel. A total of about 5,000 cubic yards of paydirt would be hauled and processed at either Processing Site #4 or Processing Site #2. All areas in the stream

would be stabilized before winter to minimize effects of potential erosion downstream in the spring. Further discussion of reclamation proposal is in the Reclamation section of this description.

Mining Site #4 (see Appendix A, pages 17 & 19): This site is approximately 3.5 acres with bedrock estimated at a depth of 30 feet. After mining is completed in this area the 3 ponds for Processing Site #5 will be constructed. During the mining phase of Processing Site #5, material would be processed at Processing Site #2. Mining would take place in parcels of 1-3 acres at a time. Mining Site #4 and Processing Site #5 are located in the valley bottom and would be considered a riparian area.

Mining Site #5 (see Appendix A, pages 17 & 19): This area is also approximately 3.5 acres and would include a portion of the Pine Creek stream channel. Mining in this site would take place in 1-3 acre parcels about 300' x 500' along the Pine Creek channel. The depth of the holes would be a maximum of 60' and down to bedrock. Work along the Pine Creek channel would not take place until the stream runs dry in late summer. Any water that is intercepted in the mining pit would be pumped into the settling ponds at Processing Site #5 or concentrated in one area of the mining pit. This entire site would be mined and reclaimed in one season so that the stream channel can be reconstructed before winter. Any channel alteration would require a joint permit from ACE and DSL. See Reclamation section below for stream channel reclamation information.

Mining Site #6(see Appendix A, pages 17 & 19): This mining site is the second West Hillside area, Area B. Area B includes a 20' buffer along the stream channel, but is still located in the riparian area. At 2.4 acres, this site would also be mined and reclaimed in one season.

Mining Site #7 (see Appendix A, pages 17 & 20): This area is approximately 5 acres in size. Mining in this site would take place beside the Pine Creek channel. Two areas in particular would be targeted, one about 1,000 feet long and one about 200 feet long, both areas are around 40 feet wide and to a depth of 30 feet. The acreage mined would be in ¼ - ½ acre parcels and would be accessed by the pipeline canyon road. The road would be improved for heavy equipment use at the time operations on this site are to proceed. The processing of this material would take place at Processing Site #5.

Mining Site #8 (see Appendix A, pages 17 & 21): This site is approximately 4.8 acres and is located across the valley from Processing Site #6. Mining would be in parcels of approximately one acre at a time to a maximum depth of 60 feet. This site would be tested first to look for values. If values exist, then this site would be mined in benches from the access road in 60' x 200' sections. High walls would be kept at 20' or less for public and miner safety. Processing would take place at Processing Site #6.

Mining Site #9(see Appendix A, pages 17 & 21): Mining Site #9 would be approximately 2.5 acres. This site would be benched similar to Mining Site #8 and paydirt would be hauled to Processing Site #6 or off BLM lands for processing.

i. Spill Prevention, Containment, and Countermeasures

No toxic substances (e.g., cyanide, lye, mercury, etc.) are used in this placer mining process. Petroleum products are the only hazardous materials used in these operations. Oil, lubricants, and antifreeze would be brought in weekly and stored on the service truck. Daily diesel and regular gas for equipment would be transported using a service truck. A containment vault would be made from earth and plastic liner to hold 110% of the fuel stored on site and designed to withstand a 100-year flood event. Ten thousand gallons of diesel and 200 gallons of gas would be stored on site in above ground tanks. The diesel and gas would be delivered by commercial trucks every 2 weeks. Waste petroleum products would be removed in original containers and disposed of in an appropriate manner off BLM lands. All applicable Federal and State regulations would be adhered to for the disposal of contaminated soil and other material. The following are the Federal and State Regulations which would need to be adhered to pertaining spills:

Resource Conservations and Recovery Act (RCRA)
Toxic Substances Control Act (TSCA)
Hazardous Material Transportation Act (HMTA)
Clean Water Act (CWA)
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
Superfund Amendment Reauthorization Act (SARA) Title 3
Oregon Spill Reporting; Oregon Administrative Rule (OAR) 340-108

A funnel would be used to minimize spills when fueling all pumps and equipment. All equipment is checked for fluid leaks before the equipment is operated, and normal maintenance (oil changes, etc.) take place on the bench over ¼ mile from Pine Creek and 1,000 feet away from the dry Brannon and Reeds Gulch channels. No fueling of equipment or routine maintenance would take place near streams.

Absorbent material would be kept on site in case of small leaks or spills of petroleum products. Contaminated soil would be removed from BLM. See Hazardous Material/Spill Contingency Plan included in Appendix B, from the DEQ issued WPCF permit.

j. Quality Assurance Plan

This project does not entail any construction of facilities such as heap leach pads, tailings impoundments for hazardous material, or use of any chemicals. Therefore, quality assurance would be provided through following MSHA regulations. Quality assurance would also be provided by complying with all terms and conditions required in permits and authorizations for the mining project.

k. Reclamation

Reclamation of disturbed areas resulting from activities are outlined in each Plan. The BLM is responsible for preventing undue or unnecessary degradation of BLM

administered public lands, which may result from locatable operations under the mining laws (43 C.F.R. 3809). In addition, the State of Oregon requires that a reclamation plan be developed for each mining project on either public or private lands (Oregon Revised Statue 517).

The total disturbances are summarized below in Table 2 under the comparison of alternatives. High Bar Mining LLC is committed to restoring the lands within the project area to a productive, pre-mining condition. To this end, High Bar Mining LLC recognizes and would conduct reclamation of the disturbance left by the previous operator while preventing erosion on all reclaimed areas.

All areas of mining would have ongoing reclamation with only a maximum of 5 acres of disturbance in active open pits including stockpiles at any one time, and 15 acres per season, on the High Bar ridge portion of this operation. The valley bottom will have 1-3 acres of pits open at a time with twice that in disturbance including stockpiles. Reclamation standards are required pursuant to 43 C.F.R. 3809 and include rehabilitation of wildlife habitat, placement of growth medium and establishment of self-sustaining revegetation. All excavations would be backfilled, recontoured, and seeded with a BLM approved seed mix. All ponds used in processing have been proposed to be left for wildlife habitat by the operator. All roads and areas of compacted soil would be ripped and seeded with any other required maintenance such as water barring and erosion control measures in place. Seeding of all areas would be done each fall for any reclaimed area. The operator would provide BLM with proof of seed mix purchase and would take pictures of seeded areas for monitoring purposes. All areas disturbed by mining activities would also be mulched with weed free straw. All equipment would be removed at the close of operations and any size spills or leaks would be taken care of before operator vacates the area.

The following reclamation measures have been proposed for stream channel reconstruction; the mined portions of Pine Creek channel would be reclaimed leaving some in-channel ponds with a meandering stream channel and banks with a 3:1 slope on Mining Sites #3 and #5. Due to the steeper portions of the channel reconstruction in Mining Site #7, the banks would be left at 2½:1 with some small in-channel ponds for amphibian habitat. No diversion ditches would be constructed. Willow shoots would be planted in the fall and also during the following spring for maximum vegetation recovery. The valley bottom along Pine Creek which is disturbed during mining operations would be fenced for 3 years to keep cattle and wildlife from harming the reclamation. Any hazardous materials used on site would be covered in a spill contingency plan pursuant to all state and federal laws and 43 CFR 3809.420 (see Appendix B).

Any roads, primitive roads, and trails currently identified within the Baker Field Office Interim Route Network (Baker RMP Draft, 2012) would be reclaimed to pre-mining widths of 12 foot BLM standard. All roads created for mining, including the 1.2 miles of pipeline road, would be re-contoured and planted with a BLM approved seed mix. All roads would be stabilized with appropriate water bar and erosion prevention features (ie. ditches, berms removed, etc.).

Wells constructed and used for mining operations would be closed in accordance with Oregon Administrative Rule (OAR) 690, providing water rights are not transferred to the BLM for stock water or to another operator.

Monitoring-Vegetation would be monitored for 3 years post reclamation of each disturbance area. This monitoring would include noxious and non-native invasive species identification, and percentage of native revegetation coverage in seeded areas. If reseeding falls short of BLM revegetation standards (see Alternative 2), the operator would be notified and the area would be seeded again.

l. Environmental Protection Measures

The operator has proposed many protection measures to minimize undue and unnecessary degradation. Many of these have already been covered above under Water/Sediment Management, Spill Prevention, Containment, and Countermeasures, and Reclamation sections, but need to be readdressed for evaluation.

Public Safety - The operator has proposed to sign and gate mining areas for public safety during active operations (see Appendix A, pages 6 & 7). There would be a watchman on site 24 hours a day to minimize loss of material or equipment and to provide for general public safety.

Hazardous Materials - A Spill Prevention plan was entered as a portion of the ODEQ permit and is included in Appendix B. The hazardous materials present at the operation site would consist of diesel fuel, gasoline, petroleum based oil, hydraulic oil, and grease. The diesel fuel would continue to be stored in the above ground tank with the lined earthen containment vault. On site storage would be limited to a maximum of 10,200 gallons of fuel. All small amounts of oils and grease for maintenance of equipment would be transported in on the service truck.

Spills would be handled according to Federal and State laws and regulations. All contaminated dirt would be removed from BLM lands and disposed of in the proper manner or at the appropriate facilities. All used oil, batteries, tires, and other waste items would be removed periodically off the mine site and disposed of properly. Spill kits would be on site for any larger spills. When leaks on equipment are observed containment of leaks would be with absorbent materials or equipment would be repaired to stop leaks.

Any garbage or scrap material not stored in the storage bins would be removed to keep the area clean. No disposal of waste or scrap would occur on site. Any and all waste or scrap would be removed from public lands.

Water Management – Best Management Practices (BMPs) would be employed during all mining activities to prevent or minimize erosion from operations. Erosion control measures to be used would include water barring, placing of woody material, seeding, and covering of topsoil while stockpiled.

Water is supplied from wells through a pipeline with a pump and a gravity fed line straight from an impoundment upstream of operations on Forest Service managed land. This water from the wells is transported through 12,500 feet of 4-6" Viclock aluminum pipelines. The gravity fed pipeline, made of 4" irrigation pipes comes from one of the in-stream ponds upstream of the project area on Pine Creek.

Water used in the washing plant would be recycled from the settling ponds once suspended sediments dissipate. Clean water from the wells would be stored in the transfer pond on Processing Site #5 which would remain unmined. All ponds would be lined and bermed to prevent overflow. A permit has been acquired for wastewater facilities from ODEQ.

Noxious and Non-Native Invasive Plant Management – During operations the proponent shall ensure that all equipment and vehicles are cleaned of all vegetation (stems, leaves, seeds, and all other vegetative parts) prior to entering public lands in an effort to minimize the transport and spread of noxious weeds. All equipment would be washed and cleared of vegetative material before leaving public lands.

Operator would work with the BLM to implement a weed treatment and control program. Chemical treatments would be performed by a licensed applicator. A BLM approved, all states certified noxious weed free seed mix list will be supplied to the operator by the botanist for reclamation of all disturbed areas at the time of seeding.

Dust Control – The proponent has proposed to use a water truck for dust abatement along haul roads and on topsoil piles.

Wildlife – The proponent would clear areas in the fall or winter to avoid conflict with ground nesting birds.

Cultural Resources – BLM identified 3 sites near the project area that are unevaluated for the National Register eligibility. These three sites would be treated as eligible and avoided until an eligibility determination is complete. If any new cultural or paleontological resources are located by the operator all activities in the area should cease immediately and the operator should notify the Field Manager and BLM archeologist. Operation in the location of the find would not resume until the BLM archeologist has had the chance to evaluate the discovery and the Field Manager has given the operator written notice to proceed.

Pursuant to 43 C.F.R. 3809.420(b)(8)(i) operators shall not knowingly disturb, alter, injure, or destroy any scientifically important paleontological remains or any historical/archeological site, structure, building, or other object on Federal Lands.

Reclamation – The Plan of Operations identifies reclamation activities in a Reclamation Plan pursuant to 43 C.F.R. 3809. Reclamation activities would consist of removal of the processing facilities, fences, gates, equipment, buildings, and supplies. Once all the equipment and structures are removed from the site, then all remaining excavations

would be backfilled, recontoured, and seeded. All roads that are included on the Interim Route Network (IRN) would be put back to pre-mining condition and all roads not included on the IRN would be decommissioned by recontouring and seeding. All areas of disturbance would be stabilized and temporary soil erosion measures put in place until a suitable plant community has been established.

The stream channel would be re-established and reconstructed with meanders and in-stream pools. Large woody material would be put in place to stabilize stream banks. Willow shoots would be planted in both the fall and spring in riparian areas to establish stream side vegetation.

A financial guarantee would have to be accepted by the BLM prior to starting operations on the approved Plan of Operations. This financial guarantee would be calculated as if BLM was to contract a third party to do the reclamation work (43 C.F.R. 3809.552).

Visual monitoring of the site would be conducted throughout operations and post operations for erosion and vegetation establishment. Corrective measures would be taken should the operator be in non-compliance of an approved Plan of Operations.

2.2 Alternative to the Proposed Action (Alternative #2)

This alternative restricts the area of mining to the ridge top to avoid operations in riparian areas which support a sensitive Columbia spotted frog population, along with avoiding channel manipulation (see Appendix A, page 4). The operations on the ridge top would proceed in a similar manner to the proposed action. Operations would start in the north with 38 acres of material all being hauled to the main processing site, Processing Site #2, to be washed and separated. Once this northern portion is completed, the operator would move down ridge for another 171 acres and mine in five acre parcels. Only the existing wells, pipelines, and pipeline maintenance road would be in the valley bottom, no mining would occur in the valley bottom.

As each five acre parcel is opened, the previous one would be filled in with washed material and topsoil would be replaced. Sediments would be cleaned out of the ponds regularly and put aside to dry then used for reclamation as growth medium.

All the same approved permits required for the proposed action would apply to this alternative and would be submitted to BLM prior to operations.

a. Access/Roads: Access would be the same as the proposed action for this alternative except that the pipeline road through the canyon would not be improved for hauling since there would be no mining along the valley bottom, but the road would be kept for ATV maintenance of the pipeline. The operator would follow maintenance stipulations put forward by BLM, MSHA, and the County Road Master.

b. Mining and Placer Equipment: Equipment proposed for use in mining and processing operations as listed above in the proposed action would be the same for this alternative. The operator would notify the BLM in writing if there is a change to any equipment listed in the Plan of Operation.

c. Buildings and Facilities: All buildings and facilities would be the same as identified in the proposed action.

d. Schedule of Operations: The proposed schedule operations would stay the same as identified in the proposed action (8 employees for 130 day per year) except that this alternative would only take approximately 15 years if all operations went as planned. The operation and reclamation would advance in the same manner as the proposed action.

e. Water Supply: Water supply would be the same as the proposed action and require the same amount for processing except that no new ponds or other processing site features would be created in the valley bottom due to the sensitivity of the riparian features and species in these areas.

Pumps, hoses, and generators associated with water supply would be stored on site and be maintained on a daily basis.

f. Water/Sediment Management: This alternative would only utilize 4 of the 6 proposed processing sites addressed in the proposed action due to the sensitivity of new Processing Sites #4 and6 being in riparian areas. Processing Sites #1-3 are on the top of the ridge away from Pine Creek and would be able to prevent discharge into the stream. However, Processing Site #5 will stay as water storage and some small processing of test material since it currently exists under a Notice.

Processing Site #1 is the currently established processing site on High Bar ridge (see Appendix A, page 9). Recently the equipment from the previous operator has been removed and the area reclaimed by backfilling the excavations and seeding. The total disturbance of this site is currently estimated at 1.5 acres including access roads and seeded areas. The proposed sediment trap pond is at 20’ x 20’ x 8’ and 4 settling ponds at 40’ x 200’ x 8’ would be replacing the 2 settling ponds reclaimed recently. There would be a sediment drying area on this site which is a 100’ x 200’ x 6’ sized stockpile which would be expanded to several acres as mining progresses. This processing site would be reclaimed once mining on the north end of the claims is finished and the processing would be moved to Processing Site #2 and then progressively to Processing Site #3.

Processing Site #2 is the proposed stationary processing site to be utilized for the duration of operations (see Appendix A, page 10). The entire five acre site would have an earthen berm surrounding it and would be fenced with hog wire and metal posts. The sediment trap pond, the first pond down from the wash plant, would be 20’ x 20’ x 8’ and continuously cleaned out as material is processed. The wet sediments from the bottom of the first pond would be put in a shallow sloped pile in a holding area which is west of the settling ponds. The 3 settling ponds used for circulating water will each be approximately 300’ x 30’ x 8’. There would be water leaving the third pond in a gravity fed pipeline and water supplied would be pumped to the first of the settling ponds

through a pipeline. This processing site is at the top of a ridge and is about 1,000' away from the Pine Creek channel.

Processing Site #3 would be approximately one acre in size and located on the Brannon Extension claim for processing on the south end of proposed mining on the ridge (see Appendix A, page 11). There would be one sediment trap pond at this location approximately 20' x 20' x 8' and the water from Processing Site #2 would be transported by gravity to this site to use in the washing plant and then would be pumped back to site #2 from the sediment trap pond.

Processing Site #5 would be approximately 5 acres and process about 500 cubic yards a day (see Appendix A, page 14). The transfer pond sized 200' x 60' x 10' would store water from both wells. Settling ponds would be sized as follows: a sediment trap pond 20' x 20' x 5' for thick sediments which would be cleaned out daily, and 3 settling ponds each sized 200' x 30' x 8' and created after mining in the area has been completed. All settling ponds would be surrounded with berms to prevent overflow.

Water quality impacts are expected to be reduced overall, but be similar to the proposed action by allowing the sediments to settle into ponds before the water is recycled through the washplant. Sediments would be handled similarly to the proposed action being cleaned out, dried and used for growth medium in reclamation.

g. Existing Disturbances

The existing disturbances are the same for all alternatives. These disturbances have supported exploration of the area for 20 years and encompass a current footprint of 15 acres across the project area. These operations were allowed under the 43 C.F.R. 3809 as notice level work. The operator already has a financial guarantee in place for the 15 acres of disturbance and this amount would be added to the larger financial guarantee required to expand operations under this alternative. These disturbances were described in detail in Chapter 1.

h. Mining Disturbance

In this alternative, Mining Sites #3-#9, totaling 25.2 acres of mining would be omitted for protection of the riparian vegetation, overall water quality, and sensitive wildlife species.

The total surface disturbance for this alternative would be 209 acres, not including newly constructed road acreages. This alternative would still include all the pipeline maintenance roads, and all the existing roads (see Table 2). The 5 acre parcels would be cleared of vegetation in the fall or winter before March 1 each year to protect ground nesting birds. Operations would be limited to working on High Bar ridge.

Mining Site #1: This area is where mining would start and the existing pit would be expanded from ½ acre to five acres. The entire Mining Site #1 would include 38 acres north of the current Processing Site #1. Bedrock is estimated to be 10-30 feet deep in this location and the proposal is to mine to the depth of bedrock. Equipment would access this depth via a temporary ramp built on the south end of the pit, which would be moved

as mining progresses north. Mining would take place from Processing Site #1 around and to the north. (see Appendix A).

Mining Site #2: This 171 acre site would be opened after reclamation is completed to BLM standards for Processing Site #1 and Mining Site #1. The proposal indicates starting at Processing Site #2 and working north to the reclaimed Mining Site #1, then working south to the southern boundaries of Brannon Extension and High Bar Extension claims. Processing site #3 would be established when haul times to Processing Site #2 get too long.

i. Spill Prevention, Containment, and Countermeasures
The Spill Plan would be the same as the proposed action and can be viewed in Appendix B. All Federal and state laws would have to be followed.

j. Quality Assurance Plan
This alternative would have no change from the proposed action to the quality assurance plan.

k. Reclamation
The reclamation for Alternative #2 would not include a stream restoration or channel reconstruction because no disturbance would take place within the stream channel. All the rest of the reclamation would take place in the same manner as the proposed action and would follow all Federal, state, and local regulations.

Monitoring – All vegetation monitoring would take place similarly to Alternative #1. In addition, the BLM would coordinate with the responsible state agencies for monitoring of well levels. Sage-grouse lek monitoring would be done by BLM in coordination with ODFW.

l. Environmental Protection Measures
All Environmental Protection Measures listed here for this alternative, would be in ADDITION to what has already been addressed in the proposed action by the operator. All other operator proposed Environmental Protection Measures would be the same as described in the proposed action. A complete list of operating stipulations and mitigations would be included in the Plan of Operation.

Water Resources and Soils– This would be the same as the proposed action along with added well monitoring and reporting in order to monitor draw down related to mining. Culverts would need to be designed to meet the flow of a high intensity event and maintained to insure proper operation. All fords would be armored to withstand the volume and weight of traffic using the crossings. Sediment and erosion control measures would be incorporated into the design and construction of the road to meet the volume and weight of the vehicles and equipment being used. Effort would be made to return soils to the place of origin. Soil stockpiles would be covered to reduce loss to both wind and water erosion. Soil enhancements, such as mulch or local organic material, should be used to assist in establishing vegetation. Roads would need to be upgraded or designed to

address the volume of traffic, weight of vehicles, topography, slope, and load bearing capacities of the soils.

Noxious and Non-Native Invasive Plants – The operator would maintain roadsides, tailings, dried sediment from settling ponds, and disturbed areas in a weed free state. Traveling through weed patches with equipment and personnel would be avoided when possible, especially when plants are seeding to prevent the spread of weed species. When traveling in known weed infestations, especially Mediterranean sage in the High Bar Plan, equipment would be cleaned, with an emphasis on the undercarriage and moving parts, before moving into other areas to work. Ensure equipment wash-up areas are monitored and treated for emerging weeds. Process mined materials at the closest processing site to avoid introducing weeds to new areas.

Wildlife – The operator and BLM would coordinate for project specific offsite mitigation for sage-grouse habitat management (see habitat mitigation plan, Appendix E). During the sage-grouse breeding season (March 1-April 30) the operator would not be able to run equipment 1 hour after sunset until 2 hours after sunrise. The Columbia spotted frog would be protected by limiting activities in the riparian areas during March 1 to May 31 for in-stream work and until July 30th where feasible adjacent to the stream channel for egg laying/hatching. Transfer pond would be shelved along the shoreline at a 20-30 degree slope to create habitat for Columbia spotted frog post mining.

Cultural Resources – All historic properties or unevaluated cultural resources would be avoided with a 20 meter buffer until the BLM archeologist has had a chance to evaluate these resources. Any new discoveries of cultural or paleontological resources would be handled the same way as the proposed action.

The operator shall immediately bring to the attention of the resource area manager, any paleontological (fossil) remains or any historical or archaeological site, structure, or object that might be altered or destroyed by exploration or mining operations, and shall leave such discovery intact until told to proceed by the resource area manager. The resource area manager and the resource area archaeologist shall evaluate the discoveries brought to their attention, take action to protect or remove the resource(s), and allow operations to proceed after notification. Should mining operations encounter human remains, the mining operation would immediately cease operations and BLM would be notified immediately. The operator shall not resume operations until notified by the resource area manager.

Reclamation – This alternative would not implement any work in the stream channel and therefore would not require a reconstruction of the stream channel. The rest of reclamation would be the same as the proposed action. All ponds except the Transfer pond on Processing Site #5 will be back filled.

Temporary fences would be used to keep cattle and other wildlife from disturbing vegetation until vegetation is well established in the reclaimed areas according to the

RMP (1989). Temporary fences can be electric or post and wire. The amount of fencing required would be a maximum of 50 acres at a time for the 3 year monitoring of vegetation.

Prior to approval of final reclamation, BLM will evaluate the site for evidence of well-established vigorous plants of the deep-rooted native species capable of providing competition to noxious weeds and providing organic material over the long-term. The authorized officer shall use evidence of these late seral species on-site after two growing seasons to determine that seedling establishment is adequate to achieve longer-term reclamation objectives through normal management. No seeding of any other, non-native species is authorized other than the seed mix list from the BLM botanist. Please contact BLM is any of the species required are unavailable or excessively expensive due to variable availability. After two years of growth, if re-vegetation is unsuccessful, BLM will assist the operator(s) to assure successful vegetative growth. By the end of the third growing season following implementation of the seeding the density of perennial seeded species is at least 2 plants per square meter (m^2). The end of the third growing season following implementation of the seeding the total percent cover (live plants, litter, standing dead plant material, and gravel/rock) value is within is at least 90% of that on a similar, unburned/un-mined range site (i.e., similar precipitation zone, soil type and land form).

2.3 No Action Alternative (Alternative #3)

For the No Action Alternative, Alternative #3, the current mining activities would continue to take place under current and future Notices and would be limited to 5 acres and 1,000 tons of presumed ore material with earthmoving equipment pursuant to 43 C.F.R. 3809.

All activities have been covered in the Current Operations portion of this document. All access and reclamation would be the same as the proposed action on a 15 acre scale. No added Environmental Protection Measures would be added to this alternative since the notice-level work taking place is not a Federal action and is allowed by 43 C.F.R. 3809.

2.4 Alternative Comparison

For each alternative in this project, there are significant changes that should be compared. In order to make an informed decision, the differences for each alternative must be made easily available for the public and authorized officer to view. Table 2 displays the combined information from both Plans of Operation as it is presented in the alternatives.

The mining disturbance is the total mining disturbance proposed for each alternative and is displayed in the 3 alternative maps (see Appendix A, pages 3-5). Riparian disturbances are all within the total mining disturbances. In addition to the alternative maps, there are maps provided by the operator with specifics on each processing area included in Appendix A.

The material processed is dependent on the amount of paydirt, the speed of the washplant, and the amount of clay in the soil. Cubic yardage coming from a mining excavation includes topsoil, overburden and paydirt. Only paydirt is processed at the washplant, all the other material is put into temporary stockpiles until reclamation.

Roads on the Interim Route Network (IRN) are open to the public and should remain open to the public. The new roads which are proposed, and not existing on the IRN, should be closed completely at the end of mining by ripping and seeding. A majority of the road miles are within the mining disturbance acreage and will have to be rebuilt after mining to open them to the public again.

Table 2: Comparisons of All Alternatives for Pine Creek Environmental Assessment

	Proposed Action (Alternative #1)	**Alternative #2**	**No Action Alternative (Alternative #3)**
Mining disturbance, including roads in the project area boundary (acres)	247	217	15
Riparian disturbance, not including roads (acres)	33.7	4	4
Processed material (cubic yards per shift)	3,000	3,000	500
Roads on IRN* (miles)	15.29	15.29	6.28
Proposed Roads, not on IRN* (miles)	3.8	2.93	1.71
Employees hired by mining operation	8	8	3

*IRN – Interim Route Network, BLM inventoried roads which are open to the public.

3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

This section describes the existing environment of the proposed project area and the critical elements which exist and may be affected by any selected alternative. A further evaluation of those effects is in the next section of this document.

The majority of the proposed action is on a ridge top with moderate sloping, in the foothills around Dooley Mountain. Depending on the alternative, there are varying acreages and degrees of work proposed in the Pine Creek drainage. This area has intermittent streams that all flow to a ditch parallel to the Burnt River, cutting off connection to a perennial stream, 3 miles from the project area on the opposite side of Highway 245.

The critical elements of the human environment are subject to the requirements specified in statue, regulation, policy or executive order and must be considered in the proposed action and alternatives in all EAs (Table 1, page 4). The elements present within the project area have been addressed in this section; all others were considered but not further analyzed.

3.1 Existing Environment

a. Air and Atmospheric Values

The project area is located within the U.S. Environmental Protection Agency, Eastern Oregon Air Quality Control Region 10. The air quality in the area is generally good and typical of large rural areas within the Blue Mountains. Wind measurements for the site have not been recorded. However at Hereford, Oregon, 5.8 miles southwest of the project area, the wind is from the southwest approximately 10 months of the year and the average speed is 3.1 miles per hour. Winds may also blow from the north, northeast, and southeast.

The mean annual precipitation is approximately 11.3 inches while the average annual air temperature is 46 degrees Fahrenheit (USBR, 2012). The mean annual snowfall is 50 inches and the monthly precipitation ranges from 0.7 inches in July to 2.2 inches in January. Mean 2-year, 2-day storm intensity is 1.1 inches (Bliss, 2012).

The project area's main source of air contaminants is from windblown dust, both off rangeland to the south and from occasional traffic along dirt roads in the area. During the spring and summer months, dust storms, field burns, and wildfires may negatively affect air quality.

Climate Change

Several activities contribute to the phenomena of climate change, including emissions of Green House Gases (GHGs), especially carbon dioxide and methane from fossil fuel development, large wildfires, and activities using combustion engines; changes to the natural carbon cycle; and changes to radioactive forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales. For example, recent emissions of carbon dioxide can influence climate for 50 to 100 years. Once released, GHGs dissipate and soon become global in nature unless quickly isolated.

Current scientific assessments regarding climate change are more global and regional in scale and impacts and projections specific to the site specific project, are limited. Estimating precise quantitative changes in the local environment is not feasible at the moment but some general assumptions can be made. The project area is a channelized, intermittent, stream with an associated riparian system and with uplands dominated by rangeland vegetation. GHGs on rangelands can be isolated or emitted due to natural processes and/or management activities.

b. Cultural and Historical Resources

Prehistory Sites

Archaeological evidence indicates that northeast Oregon was inhabited by Native American people for millennia; with indications of use in the uplands of the Blue Mountains region dating back as early as 8-10,000 years before the present. Sites that date from the earliest occupation of the region include base camps for seasonal hunting

and gathering, lithic procurement, and plant gathering and processing. Prehistoric inhabitants hunted bison, mountain sheep, pronghorn, deer, elk, and other game.

Circa 5,000 years ago, housepit villages and specialized hunting and gathering sites appear in the archaeological record for the region, with evidence for increased sedentism and reliance on fishing. At the time of early historic contact, the mountainous areas and valleys were occupied and used, on a seasonal basis, by tribes of both the Columbia Plateau and Great Basin regions. These tribes include the Cayuse, Umatilla, Walla Walla, Nez Perce, Northern Paiute and Shoshone. Descriptions of the traditions of these tribes are provided in Stern (1998), Walker (1998), Fowler and Liljeblad (1986), Steward and Wheeler-Voegelin (1974) and Murphy and Murphy (1986).

Obsidian source material occurs naturally in areas along Pine Creek, Indian Creek and areas along Cornet Creek. One quarry area is reported to be located to the north, on Forest Service administered lands, along Pine Creek. A second quarry area is reported along Indian Creek to the east. Seven sites associated with the quarry have been lands adjacent to the project area.

Historic Sites

National events have helped to mold the nature of historic resources within the Baker Resource Area. Early explorers and fur traders traversed the resource area, followed by missionaries, emigrants, miners, and military expeditions. Sites reflect the resources and activities that attracted Euro-Americans to the region from the 1840s into the first half of the 20th century. The Baker Resource Area contains historic features including transportation features such as historic trails and stage roads; mining and mining-related sites; and homesteads, ranches, and related facilities, including irrigation ditches.

Early prospecting in the area began in 1861 when a party of miners discovered gold in Griffin Gulch southwest of present day Baker City. A gold rush to the Blue Mountain region ensued, and the mining camp of Auburn was quickly established in Blue Canyon. Within three years, mining districts had been established throughout the present day Baker County region, in the Powder River, Burnt River, and Snake River drainages. These historic mining districts still contain remnants of past activities including prospects, shafts, adits, mining ditches, structures, foundations, and debris scatters. Historic placer and lode mining sites in the Burnt River area date from the late 1860s to the 1940s.

Pine Creek Mining

After nearly all the gulches near Baker and Auburn were worked for their gold in the 1880s, prospectors explored previously unexploited tributaries of the Burnt River, including Pine Creek. A map by local mining engineer S.M. Foster indicated no mines along Pine Creek in 1892. The Burnt River Heritage Center's 2007 book, *Lest We Forget: Remembrances of Upper Burnt River in Baker County Oregon*, suggests that in May 1895, Charles Bowers, Andrew Jeptha, and Bud Bowman located the Pine Creek claim; and maps by D.W.C Nelson show that Pine Creek was intensively placer mined on both banks of the creek by 1906.

In 1917, the Wyant family located the High Bar Mine, which is within the northwest section of the current proposed mining project area. The limitations on available water after the early spring runoff in this area led the miners to use crude drywashers to placer mine their claims. The Yeakley family mined Pine Creek in the 1940's and were responsible for the construction of OR BLM 504, the cabin built above the Elliot Mine sometime between 1945 and 1947. After about eight years, they leased out the mine to the Golden Dredge Company that used a pontoon dredge to mine gold (Burnt River Heritage Center, 2007).

During the 1960s and 1970s mining continued along Pine Creek and the High Bar under claim owners Ken Casper and Jack Cogswell. Instead of using the 1883 ditch on the GLO map, Mr. Cogswell ran water to the High Bar using a pipeline from a small impoundment upstream in Pine Creek on National Forest System lands.

Field Study Findings
North Wind Inc., a contractor out of Idaho Falls, Idaho, and BLM completed a Class I record search of the project area. The records search revealed that only a few cultural resource inventories have occurred near the project area in the recent past.

Seven previously recorded sites (including OR BLM 504) were identified within the vicinity of the project area, but none of these sites will be disturbed by the proposed project.

The above-ground site, OR BLM 504 was identified in the record search, and was comprised of a single story house associated with the Elliot Mining Claims. This structure was identified by M. Buckendorf, in her 2005 report, titled *BLM Historic Mines Survey Reference No. R-041497* and was later updated by North Wind Inc. in their 2011 report. The structure was recommended eligible by Buckendorf in 2005 and North Wind Inc. continued the recommendations in 2011. However, in a letter dated July 20, 2011, the Oregon State Historical Preservation Office (SHPO) did not concur with BLM due to the lack of integrity of the structure. Since, OR BLM 504 was becoming structurally unsound, and yet was still open and accessible to the public, the structure was becoming a safety hazard. Based on safety issues and BLM's eventual agreement with SHPO that the structure did not have enough integrity to be eligible for the National Register of Historic Places (NRHP); the above-ground component of OR BLM 504 has been removed. The archaeological component including the foundation of OR BLM 504 is currently unevaluated for eligibility and will be protected by a twenty meter buffer until an evaluation occurs.

The General Land Office (GLO) Survey Notes and Master Title Plat from the 1883 cadastral survey for T. 12S, R. 39E show a road called the Creighton Road running up the ridgeline to the west of Pine Creek. The book titled *Lest We Forget: Remembrances of Upper Burnt River in Baker County Oregon*, written by the Burnt River Heritage Center in 2007, suggests this road is actually the Koontz Road, built in 1863 by Benjamin Koontz. The Heritage group suggests the purpose of this road was for Benjamin Koontz

to transport equipment to his sawmill on the valley floor from the Creighton Road. North Wind Inc. intensively surveyed the area, but could not locate the road. Based on the GLO maps and modern BLM maps, it appears that within the survey area the Koontz road maybe overlain in areas where a four-wheel drive and modern road exist today. However, intact segments of the original road may exist on Forest Service and private lands adjacent to BLM administered lands.

Water rights research also located a ditch (Site PC-7) that appears on the 1883 GLO map. This historic ditch was used to bring water to the High Bar, and most likely to site PC-3 in Brannon Gulch, prior to the High Bar Claim being established in 1917. The ditch crosses a half-mile of BLM administered land and continues on to private and Forest Service land to the north for an unknown distance. About 0.12 miles of the ditch, where it forks on the south end, has been impacted by past mining activity at the High Bar. It appears that sometime in the distant past, the mining pit located on the High Bar may have removed 0.2 miles of this ditch, where it seems to have emptied into Brannon Gulch.

North Wind Inc. conducted a cultural resources Class III inventory on 559 acres along Pine Creek in 2010. Later BLM conducted a Class III inventory on 25 acres in 2011 and 2012. These field inventories were conducted to meet federal requirements to protect cultural resources that are eligible or potentially eligible for the NRHP under National Historic Preservation Act of 1966 (P.L. 89-665; 80 Stat. 915; 16 U.S.C. 470).

Survey results from the field inventories identified 11 cultural resources within the survey area. Seven of these resources have been evaluated for their significance and eligibility to be listed on the NRHP. Identified cultural resources within the survey area include: 2 lithic site and 9 historic sites. Five historic resources (PC-1, PC-3, PC-4, PC-5 and PC-6) have been determined not to be eligible for listing on the NRHP, by BLM and the Oregon SHPO (letter July 12, 2011). Site PC-2, a lithic site, was recommended as not eligible to the NRHP by North Wind Inc. and BLM in 2011. The rational for this recommendation was based on a limited quantity and variety of artifacts that are confined to a residual surface; thus the site has no potential to yield information important in prehistory. Additional subsurface testing was requested by the consulting parties and BLM contracted North Wind Inc. to conduct site testing in 2012. Test excavations at the site failed to show an intact subsurface component or information potential beyond that recovered during the initial recording. SHPO concurred with BLM's recommendation that site PC-2 is not eligible for the National Register in a letter dated January 14, 2013.

Site PC-7, a historic ditch on the 1883 GLO, lacks integrity and the potential to yield additional information beyond its original recording, and therefore, BLM and SHPO have come to the agreement that the removal of this ditch remnant will result in a "No Adverse Effect". Sites PC-8 and PC-9 are historic features associated with past mining in the Pine Creek drainage. These two resources are unevaluated for eligibility, and a twenty meter protective buffers, will be applied to protect them. PC-8 has an existing ATV road and pipeline within the 20 meter protective buffer, but no impacts are anticipated from the use of these existing developments. However, BLM will periodically monitor PC-8

(approximately every 6 months during active mining) to ensure that erosion due to ATV use is not occurring. Site BK_12_03 and the archaeological component of OR BLM 509 are unevaluated and will also have a twenty meter buffer applied.

c. Resources of Importance to Native American Tribes

Seven federally recognized Native American Tribes have indicated interest in the public lands managed in this area. The project area is within the Traditional Area of Interest for the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the Burns Paiute Tribe. Since notification of the proposed project, none of the local or regionally recognized tribes brought forth specific concerns regarding impacts to traditionally used natural resources. Generally resources of concern to the tribes include: specific plants, fish, and wildlife important for maintaining traditional lifeways.

Traditional Plants

Culturally significant vegetation has been used for medicinal purposes, food sources, fuel, creation of tools and hunting implements, horse or cattle feed, creation of dyes, basket weaving, clothing, and shelter. Some of these traditional uses continue today as tribes work to maintain important traditional practices.

A predictive model for some types of traditional plants was developed in collaboration between BLM and the CTUIR. However, this model does not cover the Pine Creek area and BLM currently has no traditional plant modeling data for this project area.

A BLM botanical field survey, included in Appendix C, found that some types of culturally significant plants occur within the project area. However, the level of past mining disturbance in Pine Creek, dating back to the 1880-90s, has likely reduced or limited the relative abundance or potential for these plants to grow along Pine Creek. The majority of the culturally significant plants identified during BLM plant surveys appears to be scattered around the Pine Creek project area and may be more abundant in other locations.

Culturally significant vegetation noted in the project area during the cultural resource inventory conducted by North Wind Inc. includes: western juniper, serviceberry, red osier dogwood, ponderosa pine, chokecherry, rose and willow.

Wildlife and Fish Habitat

Wildlife habitat within the project area consists of mountain big/basin big sagebrush with an understory of bluebunch wheatgrass and Idaho fescue grasses. Overall, the Baker Resource Area has 83,562 acres of existing mountain big sagebrush and 136,539 acres of historical mountain big sagebrush habitat. The Pine Creek community type provides habitat for mule deer, elk, game birds, small mammals, and nesting for migratory birds. The project area includes previous disturbances associated with past mining operations and existing roads. Additional information regarding vegetation and wildlife habitat in the project area is provided in this document under Existing Environment sections (f) and (j).

Pine Creek has reduced water quality and fish have not been observed or recorded within the intermittent channel. Many of the disturbances from previous mining are along the stream channel and have caused the stream channel to be highly altered.

Livestock Grazing
Currently this allotment is grazed by permittees who, to BLM's knowledge, are not part of a local or regional, federally recognized tribe. If the current permittees should ever choose to relinquish their livestock grazing permit, local tribes with treaty rights, that include grazing provisions, may choose to obtain this grazing permit.

If relinquished, treaty rights for grazing this allotment could apply to 3,240 acres of public lands. The active allowable use under the ten-year permit is 195 AUMs on public land.

Access
Access to the proposed project area is well maintained via approximately 3.67 miles of county road and approximately 11.62 miles of BLM road and ATV two-track. Currently, the 247 acre project area is open to tribal members (and the public) year around except when weather conditions make roads impassable. There may be some roads, but not all, closed to tribal members and public access during active operations for public safety under MSHA.

d. Noxious and Non-Native Invasive Plants
An intensive inventory survey for noxious weed species has not been conducted for the project area, with the exception of Mediterranean sage (*Salvia aethiopsis*); however, there are several known sites of biennial and perennial noxious weed species within the project area, mostly along roadways and around areas of previous disturbance. Mediterranean sage and diffuse knapweed (*Centaurea diffusa*) represent the dominant species within area of the High Bar Plan, while spotted knapweed (*Centaurea stoebe*) and Scotch thistle (*Onopordum acanthium*) are the prominent species in the Upper and Lower Pine Creek Plan area. Mediterranean sage is a species of concern with limited distributions in Baker County and is ideal for early detection and rapid response to minimize spread. Current infestations are concentrated around Processing Sites #1, #2, and #5. A small infestation of salt cedar (*Tamarix ramosissima*) is located in the Pine Creek valley bottom in the northern portion of the project area. Other weed species with scattered to dense distributions in both plans of operations include Canada thistle (*Cirsium arvense*), houndstongue (*Cynoglossum officinale*), whitetop (*Lepidium draba*), and cheatgrass (*Bromus tectorum*) a non-native annual grass.

Treatment efforts are ongoing and follow an integrated weed management approach, in which weeds are treated biologically, chemically, and manually by BLM employees and through partnerships and contracts. Biological control agents are active on both diffuse and spotted knapweed. A combination of chemical and manual control treatments are used for biennial species including Scotch thistle, houndstongue, Mediterranean sage, and both knapweed species. At this time, Canada thistle and whitetop (both perennial species) are not targeted for chemical treatment due to the availability of less effective

active ingredients (2,4-D, dicamba, glyphosate, and picloram) allowed under the 1987 court injunction. In addition, the 1987 court injunction only allows for the chemical treatment of federal, state, and county listed noxious weed species. A district-wide EA, tiered to the Vegetation Treatments Using Herbicides on BLM Lands in Oregon Final Environmental Impact Statement (USDI 2010), is in preparation which would permit the use of more effective active ingredients and enable treatment of both noxious and invasive weed species.

e. Water Resources

This section used information drawn from two reports: Water Resources/Soils/Wetlands by Lizandra Neives (2011) BLM Geologist for the Baker Resource Area, and High Bar Placers and Pine Creek Placers Watershed Existing Condition by Timothy Bliss (2012).

The project area is located within the Burnt River – Independence Creek subwatershed, which is further divided into six distinct drainages (Table 3) or HUC7s for the sole purpose of this project.

Table 3. Hydrologic unit levels, divisions, names, codes, and square mileage for drainages within the project area.

Level	Division	HUC Name	Code	Square Miles
1	Region	Pacific Northwest	17	--
2	Subregion	Middle Snake	1705	36,700
3	Basin	Middle Snake - Powder	170502	4,100
4	Subbasin	Burnt	17050202	1,090
5	Watershed	Burnt River - Big Creek	1705020204	147
6	Subwatershed	Burnt River – Independence Cr	170502020405	35
7	Drainage	Pine Creek	170502020405 01	4.96
7	Drainage	Middle Fork Brannon Gulch	170502020405 02	0.38
7	Drainage	South Fork Brannon Gulch	170502020405 03	0.11
7	Drainage	Reeds Gulch	170502020405 04	0.12
7	Drainage	Unnamed ephemeral	170502020405 05	0.01
7	Drainage	Unnamed ephemeral	170502020405 06	0.02

Drainage Patterns

There are two drainage patterns in the area: dendritic, or branched, and parallel. Five of the drainages in and around the project area have parallel drainage patterns and 4 of the major drainages have dendritic patterns. Dendritic drainages concentrate more water than parallel drainages, but parallel drainages have quicker response time during major storm events (Bliss 2012).

Flow Regimes

Pine Creek, Pine Creek Tributary 3, and Middle Fork Brannon Gulch have an intermittent flow regime. Sections of Pine Creek in the Elliott Mine area have an interrupted flow. All other streams in the project area have an ephemeral flow regime. Ephemeral is a

stream which lasts for only a short period of time and leaves no permanent trace (Bliss 2012).

Ponds/Seeps/Springs/Wetlands/Riparian Areas of Concern
Twelve water bodies, including springs, fresh water ponds, and wetland areas, were identified on the northern portion of the claims referred to as High Bar. Four are located on-channel and 8 are located off-channel (Bliss 2012).

Thirty five water bodies were identified in the southern portion of the claims referred to as Upper and Lower Pine Creek. Pine Creek flows through 24 of them, 4 are on tributaries to Pine Creek, and 7 are located off-channel (Bliss 2012).

Nieves (2011) identified two wetland areas, three springs, nine fresh water ponds, and one riparian area of concern (RAC). Bliss identified 8 springs and RACs in his report and a category listed as 9+, which are water bodies frequently flooded yet shallow enough to support bottom rooted plants in part or all of the bankfull area (Bliss 2012).

Ground Water Hydrology
Bliss developed ground water information for Pine Creek, Middle Fork of Brannon Gulch, South Fork of Brannon Gulch, and Reeds Gulch. Within the Pine Creek four intermittent spring areas were observed. The Middle Fork of Brannon Gulch showed intermittent flow with the source for most of the water flow for the High Bar processing in the summer. The South Fork of Brannon Gulch was identified as having intermittent springs at the head of the drainage with the source of water being a combination of snowmelt plus seepage from the High Bar processing ponds. Reeds Gulch showed no vegetative evidence in the ephemeral draw of a seasonally high ground water table (Bliss 2012).

Maximum depth to ground water in Pine Creek varied from a couple of feet in the upper reaches to 20 plus feet at lower elevations. Structures such as culverts, dams, and springs affected the depth to ground water at different locations along the valley bottom.

Within the northern Brannon Gulch tributary, cattails were observed in one location and the ground surface was moist with moss present, suggesting the presence of a water table 1 to 3 feet below the surface. Gulches on the west side of the High Bar ridge have intermittent springs. The gulches are about 70-140 feet lower in elevation than the adjacent ridges; bedrock dips toward the gulches and spring areas (Bliss 2012).

Factors directly or indirectly affecting groundwater hydrology of the High Bar ridge and Pine Creek valley bottom are; low annual precipitation, south facing and small acreage watersheds, extreme water flow, geology, loamy soils in mined floodplains, reservoirs and stream diversions, intermittent and ephemeral flow, and groundwater augmentation from seepage.

Peak flow, annual flow, and base flow of Pine Creek throughout the project area are reduced by upstream reservoir storage and evaporation, and by an upstream out-of-basin

diversion to the High Bar area of up to 0.5 cfs of live flow between about April 1 and August 1 of each year when Pine Creek flow is so low it cannot be diverted for water right purposes (Bliss 2012).

Factors affecting surface water include roads with fords and culverts.

Roads:
Roads and the associated berms and ditches can channel water from rain and snowmelt. There is an extended network of roads in and around the project area. These roads can function as ephemeral stream channels and have the potential to deliver water and sediment to streams, water bodies, floodplains, and wetlands during intense rainfall or snowmelt runoff. Twenty three roads that are going to be used for mining were identified by Bliss. Issues identified in some of the roads were construction straight down ridges, excavation of the road surface below the land surface (entrenchment) and road features such as inside ditch, outside berm and parallel rut (Bliss 2012).

Fords and culverts are structures associated with roads that can directly impact the stream bed or channel. A ford is a shallow place where a river or stream may be crossed by wading or crossing in a vehicle. Fords can be a source of sediment in streams and four were identified within the project area (Bliss 2012, page 29). Culverts concentrate and channel water. Erosion issues can occur if culverts are improperly placed, incorrect size, or not properly maintained. Two culverts were found in the project area, open and functioning properly (Bliss 2012, page 29).

Water Quality
Information about water quality for the project area and the nearby Burnt River was obtained from the ODEQ website (ODEQ 2011a). Information on the Burnt River adjacent to the project area (river miles 59-63) is included because it is the first receiving waterbody for any water and sediment that might, but would be unlikely to, leave the project area during any infrequent high-intensity storm (Bliss, 2012).

<u>303(d) Lists:</u> Pine Creek is not on any of the Oregon 303(d) lists. However, the Burnt River is included on the 2004/2006 303(d) list and earlier-dated lists. The Burnt River (adjacent to the project area) is currently listed as water quality limited for Chlorophyll a, Dissolved Oxygen, and Temperature. Total Maximum Daily Loads (TMDLs) have not been developed yet for this portion of the Burnt River.

Based on water quality concerns for the Burnt River, further discussion is projected below for Chlorophyll a, Dissolved Oxygen, and Temperature for the project area:

<u>Chlorophyll a and Dissolved Oxygen:</u> Information about the status of Chlorophyll a and Dissolved Oxygen in the project area is based on general observations of conditions along Pine Creek by Bliss Enterprises LLC in October and November 2011 (Bliss 2012).

Waterbodies which held water in late October and early November 2011 had thick communities of aquatic plants in residual water and a mat of dried aquatic plants below

the high water line. Many dry waterbodies had similar mats of dried aquatic plants. The 3 mile section of Pine Creek within the project area had a coating of dried algae. These conditions suggest at least a moderate level of Chlorophyll a and moderate level of dissolved oxygen may have existed in many Pine Creek reservoirs and perhaps within Pine Creek itself as the stream dropped from peak flow in May to no flow in different reaches in June and July. However, these conditions are just part of the natural cycle of conditions associated with intermittent waterbodies and streams in the vicinity of the Pine Creek drainage (Bliss 2012).

Water Temperature: The BLM has no water temperature data for any drainage within the project area. However, site conditions and historical studies were used to estimate summer stream water temperatures before channel dry-up (i.e., daily maximum stream temperature in June-July) of about 70 to 85 degrees Fahrenheit. The primary indicator of high summer water temperatures was the presence of a dried algae mat in the bottom and sides of the dry stream channel and waterbodies. Factors that contribute to this condition include very low water flow before streams dry-up in mid-summer, the south-facing aspect of the Pine Creek drainage, and a lack of stream shading. However, the high water temperatures described above are a natural condition of low-elevation, low-shade, south-facing intermittent streams (Bliss 2012).

Historical study data indicates that water temperatures of low-elevation, low-discharge, intermittent streams in northeastern Oregon (including Pine Creek) naturally exceed ODEQ's summer water temperature standards described in Oregon Administrative Rule (OAR) 340-41-0028, and that the natural conditions criteria described in OAR 340-41-0028(8) apply to Pine Creek (Bliss 2012).

Water Use

Information on water use for the project area was obtained from OWRD's Water Rights Information Query (OWRD 2011d), sections containing Table 20b and related discussion and onsite-observations. Water use is described in water rights by the source, maximum rate/quantity, use, period of use allowed, point of diversion (POD), place of use (POU), and conveyance facility if any (Bliss 2012).

Information on water use in water rights is shown in Table 4. Information regarding each individual certificate is displayed in Table 5. Codes used in the table are: DO = Domestic; FC = Fish Culture; FP = Fire Protection; IM = Industrial/Manufacturing; LV = Livestock; MI = Mining; RC = Road Construction; WL = Wildlife FS = Forest Service managed lands (Bliss 2012).

Table 4. Water Use Information for Pine Creek from Water Rights - listed in order by POD from upstream to downstream.

Water Use ID: (Permit or Application #, Priority Date	**Source**	**Rate or Quantity**	**Use**	**Period of Use Allowed**	**POD location (T. 12 S., R. 39 E.)**	**POU location (T. 12 S., R. 39 E.)**	**POD, POU or pipelines in the Project Area**
Cert. 78036, 1983	Freeman Spring	0.5 gpm	LV	Year long	Sec 35, T11S, R39E	Sec. 35, T11S, R39E	No-FS
App. P83696, 1997	Pine Creek & tributary	Storage capacity of RPP Ponds 1, 2, 3; BP ponds 1 & 2; Placer Pond	FC, FP, LV, MI, RC, WL	Year long	Sec 3, 10	Sec 3, 10	No-FS
Cert. 63899, 1982	Miners Dream Spring	0.5 gpm	LV	Year long	Sec 10	Sec 10	No-FS
Cert. 6669, 1922	Pine Creek	0.1 cfs	DO, IM	Year long	Well-NWNE; spring-SWNE of sec 15	SENW & NE sec 15	YES
Cert. 63267, 1976	Pine Creek	0.5 cfs	MI	Year long	SWSE sec 3	SESW sec 10; W ½ sec 15	POU & BLM part of pipeline
Permit G-12525, 1993	Deep ground water	1.0 cfs between 2 wells	MI	Year long	Well 1-NWNE sec 22; Well 2-NWNW sec 26; Well 3-NWNW sec 26	Sec 9, 10, 14-16, 22, 23, 26, 27	PODs, POUs, & pipelines
Cert. 5880, 1868	Pine Creek	2.5 cfs	MI	Year long	Sec. 3, 22, 26, 27	Sec. 15, 22, 26, 27	POU, ditches, penstock

Water use from sources listed in Table 4 is discussed in Table 5. Water use information from water rights is included in this report because exercise (and non-exercise) of water rights is part of existing effects on stream flow, ground water tables, soils, riparian areas, wetlands and uplands (Bliss 2012). Water rights are also issued by the OWRD and require permits for water use.

Table 5. Estimated Water Use for Water Developments Listed in Table 4 and the Effect of Water Use on Pine Creek(Bliss 2012)

Water Use ID:	**Estimated Water Use and Effect on Project Area**
Certificate 78036, 1983	*Quantity*: 0.001 cfs. *Effect:* Water use occurs high in the watershed and is so small it has a negligible (unmeasurable) effect on Pine Creek flow through the project area during the summer grazing period and no effect when not being used by livestock.
Application P83696, 1997	*Quantity:* Minimum consumptive water use of 4-5 acre-feet consists of evaporation from the 6 reservoir surfaces during the ice-free period when the reservoirs are storing water. Additional water use can occur during summer up to the full storage capacity of the reservoirs (7.8 acre-feet) for any of the uses listed in the water rights. *Effect:* The flow of Pine Creek through the northern part of the project area is diminished during the fall/winter period until these upstream reservoirs have refilled with water. Evaporation from reservoir surfaces during the ice-free period reduces water flow over spillways and may prevent water flow over spillways from late July to the time when frost shuts off riparian area transpiration.
Certificate 63899, 1982	*Quantity:* 0.001 cfs. *Effect:* Water use occurs high in the watershed and is so small it has a negligible (unmeasurable) effect on Pine Creek flow through the project area during the summer grazing period and no effect when not being used by livestock.
Certificate 6669, 1922	*Quantity:* Current water use is zero. *Effect:* There is no effect on the project area.
Certificate 63267, 1976	*Quantity:* Up to 0.5 cfs is diverted during the mining season when a large enough flow of water is available at the point of diversion (see Table 20b). *Effect:* Water use reduces the flow of Pine Creek at the point of diversion by about 25% to 95% during months water is available and diverted. The effect on the project area is lessened by water that rises in the more than 1-mile long channel between the point of diversion and the project area.
Permit G-12525, 1993	*Quantity:* 1 cfs. *Effect:* Pumping from the 250-foot deep bedrock aquifers will have no direct effect on the Pine Creek alluvium aquifer.
Certificate 5880, 1868	*Quantity*: Water has been used for mining when it has been available; historical water use was the entire flow of the stream. *Effect:* Period of use for mining by ditch and penstock along Pine Creek was whenever water was available. Pine Creek is dewatered by the diversion ditches.

Riparian Area Proper Functioning Condition Ratings

Streams in the project area were evaluated by Bliss in 2011 using BLM TR 1737-9 Process for Assessing Proper Functioning Condition written in 1993. Riparian areas were given one of three proper functioning condition ratings based on the definitions below, which are from the BLM publication (Bliss 2012).

Proper Functioning Condition (PFC): Adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows. Riparian-wetland areas control erosion and maintain water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize stream banks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater diversity.

Functioning-at-Risk (FAR): Riparian-wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

Non-Functional (NF): Riparian-wetland areas clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, etc.

The evaluations made by Bliss in 2011 are in Table 7, with his interpretation and reasoning.

Table 6. Proper Functioning Condition (PFC) ratings in Brannon Gulch and Pine Creek stream reaches within the project area by Bliss Enterprises LLC in 2011.

Stream Reach Name	Reach Description	Rating
Brannon Gulch – West Fork of the Middle Fork	The lower 200 feet of this drainage are within the archaeology survey boundary and the lower 3,500 feet are a receiving stream for any runoff from the north end of the project area. There is a 3-foot high dam at the confluence with the East Fork of the Middle Fork, beyond which there appears to be no surface water flow. There are dams/reservoirs 750 feet and 1,400 feet upstream from the confluence; only the lower dam/reservoir appears to periodically pass some flow. There are two pit ponds beginning 3,100 feet upstream that pass no flow. An 11-foot high dam, located 4,200 feet upstream (700 feet above the receiving reach) captures all flow from the upper part of the drainage. Short reaches of scoured channels exist above the lower 3 dams (20% of the receiving reach). About 60% of the receiving reach has discontinuous, well-developed sedge-rush riparian areas that	FAR

	exhibit signs of livestock trampling damage. **Reasons for FAR rating:** The drainage is stable, with well-developed riparian areas, and has less erosion and scour channel than under natural conditions. The natural hydrologic function of the drainage has been disrupted by 4 dams, 2 ponds, and several mine tailings. Riparian areas have been trampled by livestock.	
Brannon Gulch – Middle Fork and East Fork of the Middle Fork	The study area includes 1,700 feet of the East Fork of the Middle Fork and 150 feet of the main stem Middle Fork below the West Fork/East Fork confluence. There are 3 low-height, in-channel dams in the lower 700 feet of this reach. There is a well-developed riparian area along more than 95% of the reach. A stream channel (averaging 6 inches wide) was present along most of the length of the riparian area in 2011; maximum water depth was about 1 inch. The riparian area and stream channel receive water via groundwater seepage from the High Bar processing ponds; without this water there would be little riparian vegetation along this valley. **Reasons for PFC+ rating:** Stream channel and floodplain have well-developed riparian vegetation caused by groundwater seepage from mine processing ponds; sediment movement along the channel is very low.	PFC+
Brannon Gulch – South Fork	There is small herbaceous riparian area at the head of the drainage where water surfaces on bedrock in the spring time; it is grazed, has been compacted from livestock trampling, and shows little evidence of accelerated erosion. The entire drainage below the spring area has been mined and is mostly flat in width, with little new channel incision or sediment movement by the ephemeral flow regime. **Reasons for FAR rating:** Heavily grazed riparian area; mined; loss of channel.	FAR
Pine Creek –Tributary 2	The only part of this tributary within the project area is an ephemeral channel on an alluvial fan/delta. The site is forested (ponderosa pine) and adjacent to a wetland. The channel is stable with shallow incision, and is depositing sediment as expected; the channel upstream of this site has low sediment production potential. Heavy annual needle-fall onto the channel/floodplain slows any runoff and encourages sediment deposition. **Reasons for PFC rating:** Channel on the delta is stable and functioning as expected.	PFC
Pine Creek –Tributary 3	There is a 200-foot long intermittent spring area and riparian area on the cutbank and part of a roadway between a culvert and pond/reservoir; water flows 400 feet down the roadway to Pine Creek and through a culvert. The riparian area is grazed and trampled, but has little evidence of accelerated erosion. The source of water for the riparian area is unknown; though it may be a pond/reservoir or an extension of the riparian area aquifer on the west side of a wetland. **Reasons for FAR rating:** Riparian area is partly in the middle of a road; grazed; rutted.	FAR

In summary, large portions of the Pine Creek drainage have been impacted by historic mining activities which have caused changes in the channel morphology, bed structure, and vegetation. In addition to the mining and grazing activity in the channel, diversion ditches and other water improvements (stock tanks, headgates, etc.) were put in place for mining and livestock grazing.

f. Vegetation and Botany

The following vegetation objectives come from the Baker RMP (USDI 1989) and are used to determine the existing condition and desired future condition of the project area:

- Manage upland grass-shrub vegetation to achieve a mid-seral stage plant community.
- Improve habitat quality for deer, elk, grouse, and turkey.
- Enhance the riparian habitat along Pine Creek and tributary streams by stabilizing the stream banks and by increasing the vegetation structure.

Vegetation within the project area and adjacent areas consists primarily of one riparian channel and uplands with sagebrush, principally mountain big sage (*Artemisia tridentata vaseyana*), basin big sage (*Artemisia tridentata tridentata*), and western juniper (*Juniper occidentalis)* communities with an understory of perennial grass species primarily Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg bluegrass (*Poa secunda*), squirreltail (*Elymus elymoides*), and localized areas of cheatgrass (*Bromus tectorum*) and other non-native annuals. Ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), mountain mahogany (*Cercocarpus ledifolius*), bitterbrush (*Purshia tridentata*), snowberry (*Symphoricarpus sp.*), and chokecherry (*Prunus virginiana*) are common at the highest elevations with an understory of blue wildrye (*Elymus glaucus*), mountain brome (*Bromus marginatus*), sedges (*Juncus sp.*), and needlegrasses (*Achnatherum sp.)*. Please see attached filed survey sheet for a full species account listed in Appendix C.

Only federally listed threatened and endangered plants will be addressed in this document. Regarding fisheries, wildlife, and plant habitat, 43 CFR 3809.420 (7) states "The operator shall take such action as may be needed to prevent adverse impacts to threatened or endangered species and their habitat which may be affected by operations". BLM has no obligation to protect survey and manage, state threatened, or Bureau sensitive plant species in this document. BLM is required to only address impacts to threatened and endangered species (43 C.F.R. 3809.411(a)(2)(ii) and (iii) and 43 C.F.R. 3809.420 (b)(7)). Therefore, as per stipulations in C.F.R.s, only threatened and endangered plant species will be addressed in this document.

There are no endangered or threatened plant species within the project area and therefore will not be analyzed for effects in this document.

g. Geology

The project area is on the southern edge of the Blue Mountain physiographic geologic province. The Blue Mountains province is comprised of five major terranes which originated in an ocean environment to the west. Each terrane contains a distinctive assemblage of rocks and fossils. These terranes collided with the North American craton from the late Triassic through late Cretaceous geologic time periods, 235 million years ago-65.5 million years ago (Orr and Orr, 2000).

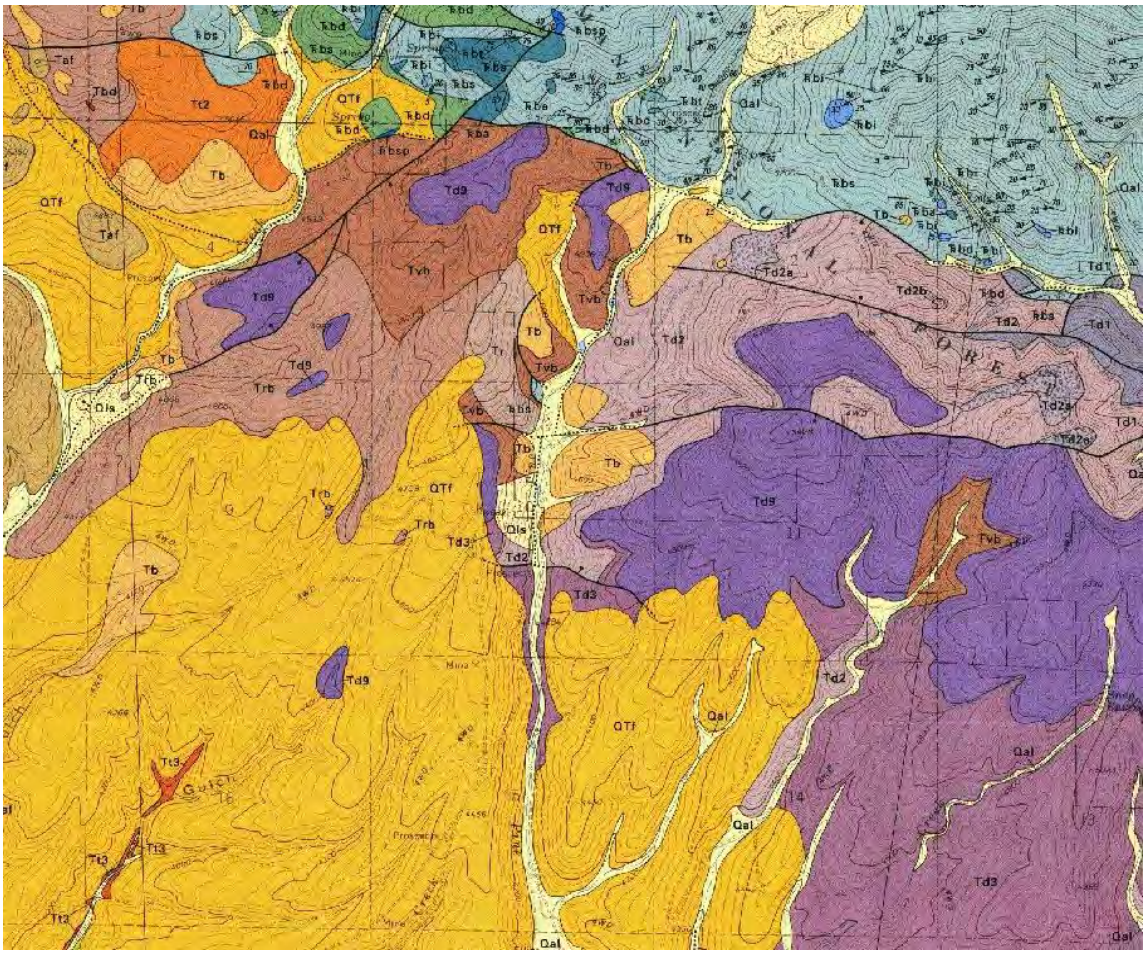


Figure 2: Brannon Gulch 7.5 minute Quadrangle
http://ngmdb.usgs.gov/ngm-bin/ILView.pl?sid=268_1.sid&vtype=b

The project area is located where concentration of Tertiary gravel deposits lay. These deposits are comprised of conglomerate, sandstone and tuff. Some of the clasts in the conglomerate are made of chert, slate, basalt, rhyolite, welded tuff, white quartz, obsidian, and rare brown jasper and green fuchsite (Evans, 1993).

Faulting occurs upstream of the project area perpendicular to the Pine Creek channel. The faulting cuts across a significant alluvial aquifer which stores groundwater. The estimation from the operator is that bedrock lies up to 60 feet below the proposed operations surface. The dip, or angle of tilt, in the bedrock layers of the area is gently

angling towards the south or towards the Burnt River, which explains the drainage of the area.

h. Soils

The project area was surveyed separately by Timothy Bliss and Lizandra Nieves in 2010, producing two unpublished reports used for reference when writing the Water Resources and this section. The entire surveyed project area has 13 soil map units which represent 11 different soil series. The full set of maps with types and properties of soils listed can be found in Appendix D.

High Bar ridge top soils

On the ridge top portion of High Bar, where 209 acres of mining would take place, there are 4 map units with 3 different soil series. The map units are 33C (Burntriver gravely silt loam), 34D (Campcreek-Skullgullch association, 12-35% slope), 34E (Campcreek-Skullgulch association, 35-60% slope), and 80E (Hyall-Simas association).

The dominant map unit and soil series in this area is the 33C, Burntriver gravelly silt loam, covering 132.89 acres. This unit is not highly erodible with moderate infiltration rates, a well-drained classification and exists on strong slopes (8.5 to 16.5 degrees).

Pine Creek valley bottom soils

The northern area of the valley bottom is identified as Mining Site #3 separated into three sections a, b, and c. In Mining Site #3 there are 6 map units. The map units are 104D (Marack silt loam), 106D (Marack very gravelly silt clay loam), 147E (Segundo very gravelly loam), 168C (Typic Xerorthents, cobbly), 34E (Campcreek-Skullgulch association, 12 to 35%), 83E (Inkler very gravelly loam). All maps and map unit descriptions are included in Appendix D.

The project area in the valley bottom includes 3 Processing Sites (#4-6) and 6 Mining Sites (#4-9) all covered by the soils map and labeled OR-60224 site #1 (see Appendix D). In this area there are 5 map units. These map units are 106D (Marack very gravelly silt clay loam), 34E (Campcreek-Skullgulch association, 35 to 60%), 129B (Rastus very gravelly loam), 51D (Encima gravelly silt loam), and 113E (Nagle silt loam).

In summary, the soils reflect the deeper geology of an alluvial fan structure. Many of the soils on greater than 30% slopes, are classified as extreme to very steep slopes, and are considered as well drained.

i. Range Management

The project area is within the Brannon Gulch Allotment #15201. This allotment is half private land and half public land with approximately 3,240 acres out of 6,454 acres being public land. The BLM public lands affected by this project would be approximately 7.6% of the 3,240 acres state above at the most. This allotment is under the “Improve” management category in accordance with the Washington Office direction from 1989. Therefore this allotment has a high priority for facilitating grazing (Baker RA RMP, 1989).

The livestock on this allotment are permitted to be on site from April 20-June15 annually. The allotment is permitted for 195 AMUs and 230 head of cattle. The BLM is currently revising the 1989 RMP to reflect new Standards and Guidelines for range management. The 1989 RMP decision declares that continuing authorization of grazing on all grazeable land and implementing appropriate grazing to improve native vegetation within this allotment.

There are no currently developed livestock watering areas with troughs within the public land portion of the allotment. Water supply for the livestock and wildlife exists of in-stream ponds along Pine Creek on public lands from previous mining operations.

j. Wildlife and Special Status Species

The Baker RMP directs BLM to "Continue identification of wildlife habitat requirements as other resource activity plans are developed" within Baker Miscellaneous Geographic Unit (USDI 1989a, pg 18). Land use plan direction indicates direct management for wildlife in the following:

Resource Condition Objective - "meet the forage requirements for big game as recommended by the ODFW (pg. 115).

- Enhance habitat for potential transplant [wildlife].
- Improve habitat condition for wintering deer.

Allocation - "Restrict livestock use through seasons of use, utilization levels and livestock numbers on key wildlife areas and crucial deer winter range." (p. 115)

- Allow transplant of wildlife species.

Management Action - "Provide suitable habitat for transplanting wildlife" (pg. 115).

- Plant shrubs and forbs where needed on crucial winter range

Endangered Species Act and Special Status Species Considerations

According to the best available records and field observations, no established federal or state listed species currently occur within the project area. Several unlisted species present are of concern to the U.S. Fish and Wildlife Service (USFWS), of those species some are listed as special status species for the BLM. BLM believes most of the species that could theoretically occupy the project area are not there for a variety of reasons such as: habitat connectivity, population numbers, habitat use patterns, and/or topography; therefore, endangered wildlife species will not be further analyzed in this document.

Wildlife habitat types present and management considerations

The project area is comprised of one main riparian channel and sagebrush steppe uplands with some widespread conifer trees. No old growth juniper woodlands are present within the project area. The project area is comprised of fragmented habitat because of past and present mining activities including dredging and trenching. Throughout the riparian channel along Pine Creek there are indicators of historic mining activity in the form of dredge piles. The portions of the project area which are actively being mined have little habitat for wildlife use.

Given the dominance of sagebrush steppe habitat, the following upland wildlife habitat management documents provide important insight and guidance relevant to the analysis area: (1) BLM national sage-grouse habitat conservation strategy (USDI, 2004a), (2) Greater Sage-Grouse Conservation Assessment and Strategy for Oregon (ODFW, 2011), and (3) BLM Technical Note 417 Assessing Big Sagebrush at Multiple Spatial Scales (Karl & Sadowski, 2005), and (4) IM 2012-043 Greater Sage-Grouse Interim Management Policies and Procedures (USDI, 2012).

All 4 documents listed above describe desirable habitat conditions and promote actions needed to conserve Greater Sage-Grouse. In addition, each document highlights the importance of managing public land in a way that would support communities of sagebrush steppe species at the landscape level.

Relatively common wildlife species present
Game species present include: mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), and coyote (*Canis latrans*). Representative non-game species include red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aquila chrysaetos*), Luzuli bunting (*Passerina amoena*), yellow warbler (*Dendroica petechia*), sage sparrow (*Amphispiza belli*), common nighthawk (*Chordeiles minor*), Nuttall's Cottontail (*Sylvilagus nuttallii*), sagebrush vole (*Lemmiscus curtatus*), horned lark (*Eremophila alpestris*), Western meadowlark (*Sturnella neglecta*), loggerhead shrike (*Lanius ludovicianus*), and sage thrasher (*Oreoscoptes montanus*).

There were three ocular surveys conducted on two separate days that documented the wildlife for this area (please see Appendix C for surveys). Although numerous bird species were documented, no bald or golden eagles or nest sites were found within or adjacent to the project area. Along with the above listing of common wildlife found within the project area above, Table 7 describes the common species within the Pine Creek project area. Table 7 also focuses on species of management importance in sagebrush steppe habitats.

Table 7. Wildlife of management importance according to season of use and key habitat characteristics.

Wildlife of Management Importance within Pine Creek Project Area	**Season of Use**	**Principal Habitat Dependency for Forage, Cover, Structure, and Security**
mule deer, Rocky Mountain elk	Spring through fall	Mixed shrublands and grasslands
*sage-grouse[1] (low density habitat)	Spring through winter.	Shrublands Winter use – at least 10% sagebrush canopy cover Nesting use – at least 15%-25% or more sagebrush canopy cover Brooding- canopy cover of at least 15% of grasses and forbs
*sagebrush vole, *Brewer's sparrow[1], *horned lark, *western meadowlark, *sage sparrow[1], *loggerhead shrike[1], *sage thrasher [1]	Spring through summer	Shrublands At least 10% sagebrush canopy cover
yellow warbler[1]	Spring through fall	Woody riparian species such as willow and herbaceous species such as grasses, forbs, sedges, and rushes.
* Species associated with shrub steppe habitats that are at risk throughout the west that have declined substantially in the Interior Columbia Basin area since historical times. [1] These species indicate that they are a focal species for the Partner in Flight Conservation Landbirds in the Columbia Plateau of Eastern Oregon and Washing ton		

Special status wildlife narratives and species of local importance

There are two BLM special status wildlife species known to breed on public land, uses public land for part of their life history requirements, or have potential habitat located within the project area. These species include the Greater Sage-Grouse (*Centrocerus urophasianus)* and Columbia spotted frog (*Rana luteiventris*). Other noted concerns

include Neotropical bird species, which BLM is mandated to analyze, and big game as a species of local of importance.

Sage-grouse
The following publication were used to develop alternatives and environmental protection measures as well as contribute to the scientific background of this species; Oregon Conservation Strategy (ODFW 2011); the 12 month finding from USFWS (USFWS 2011;, IM 2012-043 Greater Sage-Grouse Interim Management Policies and Procedures (USDI, 2012); and Greater Sage-Grouse monographs (Knick and Connelly 2011).

Sage-grouse use a variety of sagebrush habitat types ranging from sparse to heavy sagebrush cover, dependent on life stage. During the breeding season sage-grouse congregate on traditional breeding grounds called leks. Leks typically have sparse sagebrush and grass cover. On the other hand, during the nesting and brood rearing life stage sage-grouse tend to select high canopy cover stands of sagebrush and a well-established understory of native grasses. Due to the complexity of life stage habitat requirements, sage-grouse are view as a focal species for sagebrush conservation (Stiver et al. 2010).

The project area is located in the southernmost range of the Baker sage-grouse sub-division, classified by the BLM as Preliminary General Habitat (PGH) and low density, category 2 habitat by ODFW. Unlike the overall sage-grouse population trend in the entire state of Oregon, stable to slight decline, the Baker sub-division was determined by ODFW as having a non-significant downward trend. However, the project has a lower concentration of leks than the Northern part of the Baker sub-division which is located approximately 18 miles north of the project area. Conversely there are only three leks within nine miles of the project area with the closest, Elliot Mine lek, approximately 1,000 feet from the boundary of the proposed mining operation. ODFW classified the Elliot Mine lek as small having 1 to 6 males per year during the breeding season.

The southernmost edge of the Baker sage-grouse sub-division is an area of concern for ODFW. Specifically, this area is in close proximity to the Malheur sub-division, which has a non-significant positive population trend, and habitat connectivity is limited between the two sub-divisions. Therefore, the project area and adjacent areas are important for the exchange of genetic material between the sub-divisions. To reduce the risk of losing this important area for genetic exchange all habitat mitigation will be conducted within the general vicinity of the project area.

The vegetative community within the project area consists of mountain basin big sagebrush with an understory of bluebunch wheatgrass and Idaho fescue grass which is suitable to provide the vegetation structure needed for nesting (Braun et al. 1977; Braun et al. 2005; Connelly et al. 2000). These grasses are also important in providing screening cover for brood-rearing (France et al. 2008).

The USFWS identified seven threats to destruction, modification or curtailment of sage-grouse habitat or range: 1) habitat conversion for agriculture, urbanization and infrastructure, 2) fire, 3) invasive plant and juniper encroachment, 4) grazing, 5) energy development, 6) climate change, and 7) habitat fragmentation. To read a full analysis of the seven threats to sage-grouse habitat please refer to the Pedro Mountain EA No. OR-030-08-004-0EA. However within this analysis the main focus will be threat number seven habitat fragmentation.

The IM 2012-043 directs that when making management decision the BLM would "consider and analyze management measures that would reduce direct, indirect, and cumulative adverse effects on Greater Sage-Grouse and its habitat. For example, consider alternatives that would increase buffer distances around active leks and timing restriction within exiting Land Use Plans as needed to further reduce adverse effects on Greater Sage-Grouse and its habitat. Consider deferring authorizations in Preliminary General Habitat (PGH) where appropriate, depending on local characteristics, new science and/or data (e.g. migratory corridors or habitat between Preliminary Primary Habitat, PPH), and relative habitat importance if authorization could result in Greater Sage-Grouse population loss in PPH. Consider offsite mitigation measure in collaboration with state wildlife agencies and project proponents when authorizing activities."

This analysis includes a habitat mitigation framework that would address the standards set forth in Oregon Administrative Rule (OAR) 635-415-000 and needs of USFWS habitat protection of sage-grouse. Mitigation framework for sage-grouse outlines an interim guidance for development of ODFW habitat mitigation recommendations associated with landscape scale industrial-commercial developments in Greater Sage-Grouse habitat in Oregon. The BLM and ODFW work cooperatively together on the management of wildlife and wildlife habitat under a statewide Memorandum of Understanding (MOU) signed by both agencies in 2001.

Columbia spotted frog

Columbia spotte frogs are rarely found far from water and make their homes in or near permanent lkakes, ponds, slow-moving streams and marshes in a wide variety of wetlands, forest types, grassland, and sagebrush communities (Welch and MacMahon, 2005). Water bodies that are deep enough that they do not freeze below the surface area are required for over-wintering of adults and juveniles. Columbia spotted frogs prefer thick algae and abundant aquatic vegetation for cover and like to hide in rushes, sedge and grass which are common in shallow waters (Bull and Hayes, 2002). A survey conducted in Auguat of 2011 by the BLM determined that spotted frogs exist and are found throughout the Pine Creek channel and wihthin in-stream pools and ponds. The survey also found both adults and juveniles within the pools and ponds indicating Pine Creek has suitable habitat for their reproductive life stages (e.g. egg masses, tadpoles).

Neotropical Migratory Birds and Eagle Species

Under Executive Order (EO) 13186 the BLM is mandated to strive to protect, restore, enhance, and manage habitats of migratory birds, and prevent the further loss and

degradation of habitats on BLM managed lands. The BLM also has a responsibility to adhere to the mandates set forth under the Migratory Species Act of 1918 (MBTA). This act implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the MBTA, it is unlawful to pursue, hunt, take, capture (or kill) a migratory bird except as permitted by regulation (16 U.S.C. 703-704). In addition to the EO and MBTA, the BLM has a Memorandum of Understanding (MOU) with Partners in Flight (PIF) to stimulate and support an active approach to conservation of landbirds in Oregon and Washington. The overall goal of PIF bird conservation planning is to ensure long-term maintenance of healthy populations of native landbirds. The project area provides habitat for Neotropical migratory land birds (birds that migrate that are not waterfowl or birds associated with wetland areas) that prefer sagebrush, grassland, and juniper woodland habitats (see Table 7). Migratory bird species use suitable habitat in this area for nesting, foraging, and resting as they pass through on their yearly migrations. Grassland and sagebrush associated species include sage sparrow and within the riparian areas include the yellow warbler. Within the project area upland sagebrush has a moderate canopy cover that is adjacent to riparian area that has trees that are widespread; migratory bird diversity and richness is relatively high. In addition to the Migratory Bird Treaty Act, the Department of Interior is responsible for the welfare of both bald and golden eagles and their habitat by regulation (74 FR 4686; 50 CFR 22.26). Although no bald or golden eagles were identified when the survey was taken, if bald or golden eagles had been or are observed in the future best management practices would be developed to help protect nesting sites.

Big game

The project area is mainly comprised of a sagebrush steppe habitat community with one large riparian channel that Pine Creek flows through. Big game would use this area as a part of their life-history needs. Some common big game species within this project area are mule deer and elk. Proper grazing use practices and careful application of land treatments would conserve and benefit big game habitat.

k. Fisheries and Fish Habitat

The below information is strictly related to fish and their habitat. More in depth water resources information, including hydrology, groundwater, surface water flows, water quality, and stream channel alterations, can be found in the Water Resources portion of this report.

There are no streams with perennial flow in the project area. The closest perennial stream to the project area is the Burnt River, which Pine Creek, Brannon Gulch, and Reeds Gulch historically had a hydrological surface connection with, but those connections have since been modified by roads or intercepted by irrigation ditches. Pine Creek, the largest drainage within the project area, contains reaches with an interrupted flow regime, which is defined as a stream with discontinuities in space or where there is no defined stream channel at all (Bliss, 2012).

The Pine Creek channel in its entirety is approximately 6 miles long, with the lower 3 miles within the project area. There are many in-channel ponds and reservoirs

throughout the Pine Creek drainage. The headwaters of Pine Creek, which originate on the south side of Bald Mountain and on National Forest System lands, include a perennial east fork and dry west fork.

Fish and other aquatic species are dependent on the condition of riparian habitat, aquatic habitat (e.g., pools and riffles), and water quality for growth, reproduction, and survival. Within the project area, both rangeland and forested ecosystems contribute to existing riparian and aquatic habitat conditions. The only riparian and/or aquatic habitat survey data available for drainages within the project area is described in the Riparian Area Proper Functioning Condition section and displayed in Table 6.

Regarding fisheries, 43 CFR 3809.420(7) states: "The operator shall take such action as may be needed to prevent adverse impacts to threatened or endangered species and their habitat which may be affected by operations." There are no fish or aquatic species protected under the Threatened and Endangered Species Act within the project area. BLM has no obligation to address any survey and manage, state threatened, or Bureau sensitive species. Therefore, fisheries and fish habitat no longer needs to be addressed in this document.

l. Visual Resources and Recreation

The project area is located in a Visual Resource Management (VRM) Class III/Class IV area. The objectives of these two VRM classes are primarily for general scenic landscapes which represent a low to moderate aesthetic value. Some portions of this project may be seen from the main county road over a short duration of time, but would not attract the attention of the casual visitor nor would they dominate the viewshed (BLM Baker RA RMP Record of Decision, July 1989). The majority of the disturbance in the proposed action would take place on the top of a ridge on the opposite side of Pine Creek from the County Road 731. Most of the work would be on fairly gentle slopes vegetated with grasses and sagebrush. The equipment used in the project may be visible on the horizon by the casual driver from County Road 731 on occasion; however, the activities and visual intrusions witnessed would conform to visual objectives of the VRM Class III and Class IV areas.

Recreation and public uses within the area includes but is not limited to big-game and upland bird hunting, rock hounding, casual use mining, camping, OHV use, driving for pleasure, sight-seeing and by livestock permittees.

Access to the proposed project area would be via Highway 245, 40 miles from Baker City, Oregon and just outside Hereford, Oregon. The project location is 3.6 miles up County Road 731 off spur roads. The other roads accessing the ridge consist of primitive roads and trails which are not commonly used by the public. Three other roads which will be used originate from Highway 245. Public access to the BLM lands will continue except in areas of active operations where entry would create a safety hazard.

m. Socioeconomic Resources

Baker County is located on the eastern edge of Oregon between Union County on the north and Malheur County to the south, both of which used to be part of Baker County. Baker City is the county seat and the county has a population just over 16,000 people.

History

Baker City has signs of historic wagon trains along the Oregon Trail still visible east of town on Flagstaff Hill. Gold was reported discovered in Griffin Gulch to the south of Baker City in 1861 and by July 1862, there was a tent city of 1,000 men (Orr and Orr, 2000). The original county seat of Baker County for 6 years was Auburn; a city built up from an active gold mining population and now considered a ghost town. Baker County was home to the Sumpter Valley gold dredge which is still on the outskirts of Sumpter in a state park along with the dredge piles for 6 miles along the Powder River. Once gold mining dwindled off in the 1950s, Baker County's economy switched to agriculture in the wide, fertile Powder River Valley.

Economy

Original settlers came off the Oregon Trail to settle near the Elkhorn Mountains and the southern end of the Wallowa Mountains for gold mining. There was an influx of people looking to make it big in the 1860s, establishing Baker City in 1874.

The economy in Baker County now includes tourism, which has been growing in the last few years drawing people from all over the country. There have been a few national ghost hunting shows filmed within Baker County, Baker City has been listed as one of America's top small towns, Sumpter Valley Railroad is a tourist attraction along with the Sumpter Dredge State Park, and there are many activities during the summer including Miner's Jubilee, the Baker City Cycle Classic, and Hells Canyon Motorcycle Rally.

Demographics

As of the 2010 Census, the population of Baker County is 16,134, which is down from 16, 741 in 2000. In 2000, the racial breakdown shows that the county was 95.68% white, 0.23% African American, 1.09% Native American, 0.38% Asian, 0.04% Pacific Islander, 0.92% other races, and 1.65% from two or more races (Wikipedia, 2013).

The median income for a household in 2000 for the county was $30,367, and the median income for a family was $36,106. About 14.70% of the population of the county was below the poverty line (Wikipedia, 2013).

n. Human Health and Safety, Hazardous Materials

This project area would be closed to public access during active operations to minimize the safety hazards associated with mining activities. The public would be notified by signs along roads what the protocol is for being on site during mining activities. In order to comply with Mining Safety and Health Administration (MSHA), any non-employee would have to check into the mine site and review a safety video along with wearing

proper Personal Protective Equipment (PPE) provided by the operator. Minor amounts of hazardous petroleum products could be introduced to the environment from equipment break downs or repairs.

4.0 ENVIRONMENTAL CONSEQUENCES

The effects to Critical Elements from Table 1 will be addressed in this section by alternative. The sections are separated similarly to the Existing Environment portion of this document. Section 4.1 will discuss the elements that are in the area and potentially affected, but not discussed further due to similar negligible effects throughout the range of alternatives. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by the action and occur later or farther away but are still reasonably foreseeable. Duration is defined as short-term with impacts occurring or persisting less than two years, or long-term with impacts occurring or persisting for more than two years.

4.1 Critical Elements Considered But Not Evaluated Further

Air and Atmospheric Values

None of the alternatives will have any effects on Air and Atmospheric Values. There may be sufficient changes to long term precipitation patterns as well as runoff timing and frequencies to have some effect on riparian recovery. Future potential drought and changes in precipitation amounts may force the use of more drought tolerant species in rehabilitation efforts on the uplands. Since the operator has addressed air quality by using water trucks to limit dust during operations and is not crushing material on site, the effects will be negligible and not be addressed further.

Regardless of the alternative analyzed, the two primary actions that could influence Greenhouse Gas (GHG) levels are the removal and replacement of vegetation and carbon stores in the ground over time and the direct tail pipe emissions from equipment used in the mining operations. At the peak of mining season, several pieces of equipment would be running 8 hours a day releasing GHGs into the atmosphere. Based on analysis of various proposed activities in the 2011 Baker Field Office Draft RMP and Environmental Impact Statement, the size and scope of the proposed actions under this EA would only contribute negligible amounts (less than one-half of one percent) of annual GHGs to the Baker Resource Area.

Cumulatively, due to the global nature of GHGs, once released, all emissions may contribute to climate change to a certain extent. However, long term contribution from this proposed activity is minimal when compared to the total from other sources regionally and globally. Over time some carbon appropriation on the site will occur once operations cease. Anticipated effects of climate change itself on the resources on the site are not expected to occur at a rate to be a factor for several decades. Climate change will not be addressed in the rest of this document due to the negligible affects to resources.

Vegetation and Botany

There are no threatened or endangered plants under the Threatened and Endangered Species Act observed in the project area and therefore will not be further evaluated in this document (see Vegetation and Botany Existing Environment).

Geology and Mineral Resources

The geology and mineral resources in the area will stay the same throughout the project. The only effect that any of the alternatives would have is removing gold which is a non-renewable resource as a valuable mineral from public lands as allowed by the Mining Law of 1872. The operations will have no effect on the bedrock geology in the area and all other effects of surficial geology will be addressed in the Soils section of this document. There will be no effect to salable or leasable minerals in this area since the project does not propose to extract common minerals or oil, gas, and geothermal resources and there are no existing leases or permits within the project area.

Range Management

Alternative 2 has proposed to put up temporary fences to prevent cattle from causing damage to reclaimed and seeded areas of the operation pursuant to the Resource Management Plan (1989). The maximum area fenced for any alternative would be 50 acres and would include processing site (safety fences) and reclaimed sites (vegetation regrowth areas with temporary fences). Alternative 2 would potentially result in the short term loss of up to 50 acres of forage over 3 years, but once the reclaimed vegetation is established and the fences removed this forage would again be available for grazing.

Along with fencing, all alternatives have discussed the existence of wells, these wells would be left open under all alternatives for livestock and wildlife water once mining has been completed and those wells no longer provide water supply for that activity. Since all alternatives would have the same outcome, there is no need to further address range management in the remainder of this document.

Fisheries

There are no threatened or endangered fish under the Threatened and Endangered Species Act observed in the project area and therefore will not be further evaluated in this document (see Fisheries)

Visual Resources and Recreation

Visual impacts during mining would be negligible to minimal. The mining and processing areas are not in prominent locations nor are they easily seen by the casual observer and therefore the proposed project would not violate the visual objectives identified for the area. Additionally, reclamation of the site to pre-mining condition would reestablish the original visual resources of the area.

The roads accessing active operating areas would be temporarily closed to provide for public health and safety and to meet mining safety regulations; however, access to the BLM lands in general would not be impacted. Maintenance of the roads by the operator may promote improved recreational access to the Interim Route Network once operations are complete in the area; however, this improvement is not expected to increase visitation to the area. Impacts to the road network would be low on all access points due to regular maintenance through cooperation with the County Road Master to have the operator service the County road. Water may be used to keep dust down during the dry months on roads used for hauling.

Human Health and Safety-Hazardous Materials

The Spill and Containment Plan, attached to this report in Appendix B, has been approved by the ODEQ an Individual Water Pollution Control Facility permit. The BLM will be notified in writing if more petroleum products are needed or stored on site for maintenance of the equipment. Mitigations for storage, use, and spill prevention are covered in the Spill and Containment Plan and will be made part of the Plan of Operation.

Human exposure to the petroleum products used during operations would be limited to employees. The operator is required to remove any soil affected by spills in an appropriate manner. The petroleum materials on site will have negligible effects to the environment and will be monitored for all alternatives, so it will no longer be addressed in this document.

4.2 Proposed Action (Alternative #1)

a. Cultural and Historical Resources

Magnitude of Impacts to Cultural Resources

The magnitude of impacts are described, where possible, and represent best professional judgment based on the available data from the cultural resource survey and testing completed in 2010-2012, and using the following guidance:

Negligible: Impacts to cultural resources would be so slight as to be barely measurable or perceptible, either beneficial or detrimental.

Minor: Impacts to cultural resources would be measurable and detectable, although they would be slight and localized to a small area (less than 10 acres) for a site or very small group of sites. The action would not affect the character or diminish the features of a NRHP eligible or listed site.

Moderate: Impacts on cultural resources would be measurable and readily perceptible. The actions could change one or more defining characteristics or features of the cultural property to the extent that its NRHP eligibility would be jeopardized or would have small but measurable or detectable, affects over a larger area (10 acres to 1,000 acres).

Major: Adverse impacts to cultural resources would be substantial, noticeable, and permanent. Actions would diminish the integrity and/or character of a site or multiple sites to the extent that they would no longer be eligible to the NRHP or actions could have small but measurable or detectable, affects over a very large area (1,000 or more acres).

Direct Effects

Mining activities under the proposed action would directly disturb 30 acres of the Pine Creek valley bottom and 217 acres of High Bar ridge. These areas of direct disturbance and associated access roads would completely remove sites PC-1, PC-2, and PC-3; three sites determined not eligible for the NRHP during consultation (State Historic Preservation Office in July of 2011 and January 2013).

Sites PC-4 and PC-5 are two different historic mining ditches that would be impacted by this alternative. Site PC-4 is approximately 12,139 ft. long and the proposed action has the potential to remove 470 ft. of this ditch. Site PC-5 is approximately 10,817 ft. long and the proposed action has the potential to remove 723 feet of this ditch. During consultation, both sites PC-4 and PC-5 were determined not eligible for the NRHP.

Site PC-6 will not be impacted under any alternative.

PC-7 consists of approximately 3,277 ft. of historic mining ditch. This alternative would remove 1,478 ft. of this ditch. An additional 1,584 ft. is located outside the project area and would not be impacted by the proposed project.

PC-8 consists of a stacked rock structure, it's eligibility to the NRHP is unevaluated and a twenty-meter buffer will be utilized to protect the structure. An existing ATV road and pipeline, within the twenty meter buffer, is not expected to impact the site, but BLM will monitor the site every six months (during active mining) to ensure that ATV use is staying on the road and not impacting the structure.

Sites PC-9, BK_12_01 and the archaeological component of OR BLM 509 are unevaluated and would be protected by a twenty-meter buffer. These buffers would reduce the proposed mining area for Mining Site #3b from 2.2 acres to 1.55 acres.

Overall impacts to cultural resources would be long-term and minor to moderate.

Indirect Effects
Indirect effects to cultural resources as a result of the proposed action would be more extensive than the other alternatives. Increased mining activity and traffic in the area could increase surface erosion and impacts from human activity, such as collecting. This alternative would result in the largest increase in noise, traffic and visible alterations to the landscape, of the 3 alternatives. Vehicle traffic would increase by approximately 6 to 8 additional vehicles. Noise would increase due to the additional vehicles, processing sites and equipment needed for processing raw materials from a maximum of 247 acres. Also, the duration of the traffic and noise would be longer (approximately a 20 year time frame for the project) and likely more consistent on a weekly basis (approximately 5 days a week and 130 days per year). This could impact historic properties if they are located within the viewshed and audible area of the proposed project and if the characteristics that make the properties eligible are affected by changes in the visual and audible environment. BLM is currently not aware of any historic properties that contain these characteristics in the area.

Overall impacts would be long-term and minor.

b. Resources of Importance to Native American Tribes
Magnitude of Impacts to Resources Important to Native American Tribes
Impacts are assessed assuming compliance with Section 106 of the NHPA and government-to-government tribal consultation and identified mitigation. The magnitude

of impacts are also described, where possible, using the following guidance for resources of importance to Native American Tribes:

Negligible: The impact to Native American areas of concern and access would be at the lowest levels of detection, barely measurable with any perceptible consequences, either beneficial or detrimental.

Minor: The impact on Native American areas of concern and access would be measurable or perceptible, but it would be slight and localized in a relatively small area (10 acres or less). The action would not affect the character or permanently impede access to traditional use or sacred areas. Impacts would have little effect on the integrity of traditional resources or traditional use areas.

Moderate: The impact would be measurable and perceptible. The action would change one or more characteristics or defining features of a property of traditional religious or cultural importance, sacred site or area containing desirable traditional resources. Access and availability of sacred or traditional use areas or traditional resources would be affected and could cause changes in traditional use patterns.

Major: The impact on resources of importance to Native Americans would be substantial, noticeable, and permanent. The action would change or affect one or more character defining features of a traditional resource or traditional use areas; diminish the integrity of the resource to the extent that it no longer would be able to sustain traditional or sacred uses; or prevent access to sacred or traditional use areas.

Direct Effects

Traditional Plants: Traditional plants of interest, to local and regional tribes, have been noted to occur within the project area; however exact quantities are unknown because a density survey and a frequency survey were not completed. Currently, BLM is not aware of any local or regional tribes utilizing the area for plant procurement. Based on visual surveys and professional opinion of the botanist, BLM believes that the quantity and type of traditional plants located in this area do not make the area unique for resource procurement when compared to other similar BLM parcels. Mining of the Pine Creek area has taken place since the 1880s and has led to extensive ground disturbance over time. In many areas, vegetation is coming back, but past impacts likely have reduced the overall abundance of native plants and contributed to weedy species noted in the Botanical Survey (Appendix C). Therefore, the temporary removal of vegetation on 247 acres under the proposed action would have long-term, minor to moderate impacts on traditional plants.

Wildlife and Fish Habitat: The proposed action includes the temporary removal of 247 acres of wildlife habitat for mining and processing. This would decrease the amount of wintering habitat that is available for big game and general wildlife. However, lands adjacent to the project area would support big game and general wildlife species habitat assisting in their lifecycle needs. Most wildlife would disperse into areas not being impacted by mining activity. Once the area is reclaimed, wildlife would begin to inhabit

the project area once again. Adverse impacts, from the proposed action, to big game and general wildlife habitat would be minor in magnitude (see Wildlife and Special Status Species).

There have been no observed or recorded fish in the Pine Creek drainage and therefore this action would not have any effect to any tribal fishing in the project area. Fish habitat will no longer be discussed under Resources of Importance to Native American Tribes for the remainder of this document.

Livestock Grazing: Since the permits in the project area are not currently held by individuals affiliated with local, regional, or federally recognized tribes, impacts to livestock grazing under Indian Trust Resources are not expected. Livestock grazing will no longer be discussed under the Resources of Importance to Native American Tribes for the remainder of this document.

Access: Approximately 3.6 miles of county road running north-south, on the east side of the project area would remain open and would adequately allow for access to the BLM lands in the area. However, approximately 8 additional miles of BLM road would be closed to through traffic during active operations for public safety and would require checking in with the operator and compliance with MSHA safety requirements for access. These safety closures could disrupt the access to specific locations on public lands within the project area for the short and long term. Safety requirements would be in place for the duration of the proposed 20 year mining period. Impacts to access would be minor to moderate.

Indirect Effects

Traditional Plants: If areas of resource procurement are present, the noise, traffic and changes to visuals could detract from procurement activities. Currently, BLM is not aware of any local or regional tribes utilizing the area for resource procurement. Therefore, impacts would be long-term and minor to negligible.

Wildlife Habitat and Fisheries: There would be no indirect effects to wildlife habitat or fisheries.

Access: The proposed action would create a slight increase to the overall traffic utilizing the roads adjacent to, but outside the project area. Indirect impacts from this alternative would be minor.

c. Noxious and Non-Native Invasive Plants

The magnitude of impacts to noxious and non-native invasive plants is defined as follows in the 2011 Draft Baker Resource Management Plan:

Negligible: The introduction and/or spread of noxious weeds and invasive plants would not be appreciably affected by management actions, including those that would increase or decrease ground disturbance, or those that have the potential to introduce or prevent the introduction of weeds. Negligible effect would be difficult to detect and it

would not be clear that a particular management action was responsible for the increase or decrease in the level of weeds.

Minor: The introduction and/or spread of noxious weeds and invasive plants would be slight due to management actions, including those that would increase or decrease ground disturbance, or those that have the potential to introduce or prevent the introduction of weeds. Impacts would be small but detectable. The likelihood of being able to restore an impacted area to a desired, pre-infestation condition would be high. Beneficial effects would result in conditions where existing weeds are contained and new introductions are reduced. Adverse effects would result in conditions where existing weeds would not be completely controlled, infestations are spreading, and new introductions occur.

Moderate: The introduction and/or spread of noxious weeds and invasive plants would be readily apparent due to management actions, including those that would increase or decrease ground disturbance, or those that have the potential to introduce or prevent the introduction of weeds. Impacts would be difficult to mitigate, although the ability to restore an area to a pre-infestation desired condition would be possible. Beneficial effects would result in conditions where existing weeds would be controlled and not spread further. New introductions would be minimal. Adverse effects would result in conditions where existing weed infestations persist and spread, and where new introductions would increase.

Major: The introduction and/or spread of noxious weeds and invasive plants would be clearly apparent and would be substantially affected by management actions, including those that would increase or decrease ground disturbance, or those that have the potential to introduce or prevent the introduction of weeds. Weed infestation would not respond well to mitigation measures sand would occur even with Best Management Practices (BMPs) in place. Restoring an area to pre-infestation desired condition would be very difficult or nearly impossible. Beneficial effect would result in conditions where existing weeds would be nearly or completely eradicated, new introductions would be nearly or completely eradicated, new introductions would be nearly or completely eliminated, and areas would be restore to ideal or nearly ideal desired conditions. Adverse effect would result in conditions where existing weed infestations would not be controlled and would expand rapidly. As a result, new introductions would be common place.

Direct Effects

Noxious weeds and other non-native invasive plants are excellent pioneering species, are often the first species to establish after ground disturbing activities, and are able to invade previously undisturbed habitats (Larson et al. 1997). The potential for noxious and non-native invasive species seeds and propagules to gain access to areas of bare soil, through ground-disturbing activities proposed in the project area, is high. Seeds and propagules are easily transported by heavy equipment, vehicles, people, wildlife, wind, and water. Once established on site, weed species are difficult to control due to their competitive ability for resources; prolific seed production; more than one means of reproduction; and

long seed dormancy; enabling them to spread throughout project locations and along travel corridors (Zimdahl 2007).

Overall ground disturbance under the proposed action includes 247 acres total spread between riparian (14%) and upland (86%) habitat (see Table 2). In the proposed action the area on the ridge top encompassed by the High Bar PoO is where 209 upland acres will be mined and processed at four separate processing sites (1 acre riparian), while in the proposed Upper/Lower Pine Creek PoO 32.7 riparian acres will be mined and processed between two processing sites. Ground disturbance will occur incrementally over a 15-20 year period in 5 acre sections with up to 15 acres mined annually on the ridge top. The proposed action represents the most disturbance acreage among all alternatives.

Many upland and riparian noxious and non-native invasive weed infestations cannot be avoided. Initial ground disturbance for some annual and biennial species may provide beneficial effects through mechanical control; however, continued disturbance and bare soils would make these areas susceptible to invasion. Despite ongoing treatment and monitoring efforts, weeds will continue to spread into disturbed areas. Furthermore the man-made and natural waterways within the project area provide a vector for weed spread. Processing, active mining, and movement of heavy equipment in and along streams have a high probability to break root fragments, particularly those of Canada thistle (perennial species), and send plant parts downstream to infest new areas. Plant parts may also move on equipment to processing sites, where they will infest man-made riparian areas such as settling ponds.

Based on the large acreage of disturbance of the located within both upland and riparian habitat types, noxious and non-native invasive weed species are expected to increase despite ongoing treatments. The direct effects of the proposed action are site-specific, moderate to major, long-term, and adverse.

Environmental Protection Measures (EPMs) would be undertaken to minimize adverse effects. To lessen the potential for the introduction of noxious and non-native invasive species not previously known to exist in the project area covering both proposed Plans of Operation, EPMs would require equipment to be washed prior to arrival and before being allowed to start work. To further minimize the spread and establishment of weed infestations, especially Mediterranean sage, equipment will be washed after working in known weed sites.

Reclamation would take place concurrently with the closure of mobile processing sites, testing sites, and mining. Topsoil would be stockpiled, and reclamation would take place each fall. Bare soil would be seeded with a BLM approved seed mix which will be all states certified noxious weed free seed, with the intent of establishing a vegetative cover by the following spring. These efforts strive to reduce the amount of bare soil vulnerable to noxious and non-native invasive weed seeds and propagules. Continuous inventory and treatment of new sites, and monitoring known sites, in conjunction with seeding is

critical for mitigating adverse effects and moving towards a successful restoration (see 2.1 (k) and 2.2 (k) Reclamation Plan and monitoring).

Indirect Effects
Indirect effects under the proposed action are moderate to major, adverse, long-term, and site-specific. Multiple processing sites, with continuous high levels of use and ongoing disturbance, will be operational and mined material could be processed at any site wherein the potential exists for noxious and non-native invasive weed species to spread and establish at new locations.

Noxious weed seeds and plant parts are known to be carried by vehicles and on machinery to invade new locations (DiTomaso 2000). Over 19 miles of public (15.3 miles) and mining roads (3.8 miles) exist and serve as a potential corridor for noxious and non-native invasive weed spread (Table 2, page 23). An additional 1.2 miles of ATV road was created for pipeline maintenance along Pine Creek through the canyon and will be reclaimed when mining is finished. Due to a greater amount of mining over a larger area, the amount of off-road travel is expected to be the highest under this alternative. The required widening of roads from 12 feet to 18 feet for mining safety purposes will create an additional ground disturbance of approximately 14 acres. The combination of disturbance and an existing non-native annual grass and broadleaf noxious weed species, seed bank along these roads create opportunity for spread and establishment.

EPMs targeted at maintaining roadsides and disturbed areas in a weed free state through ongoing treatment and monitoring, reclaiming roads to original widths using all states certified noxious weed free seed, avoiding overland travel through existing weed sites, processing mined materials at the closest processing site from which it was mined, and cleaning mining equipment immediately after working in known infestations and before beginning work in non-infested areas will aid in reducing impacts associated with indirect effects.

d. Water Resources
A summary of the effects standards for both Water Resources and Soils from the 2011 Draft RMP are below:

Negligible: Impacts to water resources and soils would be at or below the level of detection, and changes would be so slight that they would not be of measureable or perceptible consequence.

Minor: Impacts to water resources and soils would be detectable but localized, small and of little consequence. Mitigating measures, if needed to offset adverse effects, would be simple and fully successful.

Moderate: Impacts to water resources and soils would be readily detectable and localized, with potential consequences to the water resources and soils of the surrounding area. Mitigating measures, if needed to offset adverse effects, would be extensive and would be somewhat successful.

Major: Impacts to water resources and soils would be obvious and would result in substantial consequences to the ground water, streams, springs, riparian areas, and soils in the area. Extensive mitigating measures would be needed to offset adverse effects, and their success would not be guaranteed. Actions that would likely result in effects on the water resources and soils of the area, would be so severe that action would not be authorized or undertaken.

The water resources of the Pine Creek drainage have been affected by mining activities since the 1860s. This is evident by the Water Right Certificate 5880 which was established in 1868 for 2.5 cfs for mining and is for year-long use. Mining has occurred in this area from that time until present. The previous mining activity established roads, channels, headgates, ponds, and reservoirs.

Access roads would cause contributing water and sediment to the drainages under all alternatives. There would be excavation, removal and stock pile of soils and subsurface material. The disturbance and depth of extraction varies from 30 to 60 feet. The excavation and removal of the soil will break up the soil profile. Soils will be removed and stored separately from the subsoil and overburden. There would be utilization of existing of processing sites and ponds. Disturbances from mining would occur in five acre tracts at a time, up to 15 acres mined during one season.

Bliss determined there would be a low probability of sediment entering the Burnt River because existing catchments, ponds, and irrigation canals intercept water flow. In addition, more than 99.9% of the water leaves the cumulative watershed effects point as groundwater and as atmospheric water through evaporation and evapo-transpiraton (Bliss 2012).

Water Use: There are 7 water rights associated with the High Bar and Pine Creek claims four of these provide Points of Diversion (PODs) and Points of Use (POUs) for the mining action (see Table 4, page 36). Water for the mining operation is supplied by 2 wells and a pipeline off of U.S. Forest Service managed lands. The capacity of the production of the stream as modeled by OWRD is 1.88 cfs (Bliss 2012). As previously mentioned Water Right Certificate 5880 on Pine Creek was issued for 2.5 cfs for mining. Therefore, this one water right is 0.62 cfs more than the steam is capable of producing under normal conditions (Bliss 2012). Under existing water rights and under all alternatives surface water use actual and potential exceeds the normal production capacity of the drainage.

Water Right Permit G-12525 is listed as a deep ground water source. This source was rated at a quantity of 1 cfs and would be used in all alternatives. Bliss determined that pumping from the 250-foot deep bedrock aquifers would have no direct effect on the Pine Creek alluvium aquifer (Bliss 2012).

The washing and grading of the soils would change the infiltration rate of the soil profiles. Vehicles crush and compact road surface materials. Roads channel

precipitation and snow melt if it exceeds the infiltration rate of the road surface. For the duration of the exposure of the 5 acre parcels during the mining process there would be greater erosion from and infiltration. Courser materials would channel water into different layers of soils and water would channel along bedrock if exposed.

Streams: Alternative 1 would have the greatest disturbance in the stream channel; approximate 33 acres of riparian area would be disturbed. Both mining and processing sites would be located in the Pine Creek channel or disturbing riparian areas in the drainage. The disturbance in the stream channel would add to the existing disturbance by previous mining operations. Previous disturbances in the channel have changed the stream bed and channel characteristics causing the water to flow below the surface in areas. The below ground flow would be disrupted. Bliss reported varying flow in the channel depending on season. It could be surface flow or subsurface flow going below 20 feet (Bliss 2012).

Pipelines: The primary concern is the design, construction, and maintenance of any pipelines and associated maintenance roads. Alternative 1 would have the greatest impact to the Pine Creek channel because of the recommendation to upgrade the pipeline road for heavy equipment as mining access for the canyon. The use of the heavy equipment would increase the amount of impact to the road surface causing more sediment.

Pond/Reservoirs: As was stated in the Existing Environment section there are multiple existing ponds and reservoirs as legacy of the historic mining in the area. Alternative 1, the proposed action calls for 6 processing sites; 3 on the ridge and 3 in the Pine Creek valley bottom. Processing sites are composed of multiple settling ponds (usually 3). The 3 sites on the ridge would increase the flow/seepage in the areas and may contribute water to two wetland areas and three springs in the area. The 3 sites in the creek bottom would add or return water to the system depending on where the water for processing the material is secured from either from the two wells or the pipeline off National Forest System lands. The settling system consisting of multiple ponds would address the sediment entering the system by removing suspended sediments which occur in the processing of placer material.

Wetlands, Springs: As previously mentioned there are 2 wetland areas and 3 springs in the area. The wetland areas appear to be influenced by the mining operations on the ridge providing seepage from the ponds. The springs are located in the Pine Creek drainage. The mining process includes stripping top soil and overburden to the pay dirt along the bedrock to an estimated depth of 10 to 30 feet. In the process of stripping material to bedrock, water bearing soil layers may be encountered. The stripping may cause alteration of water flow through the soil layers and decrease available water in springs and wetlands. Springs would need to be monitored to determine the effects of the mining on the ground water in the area. Both action alternatives would have the greatest potential to impact springs in the area due to the disturbance along the ridgeline, potentially changing the ground water flow patterns which supply the springs.

Vegetation: The change in soils and water infiltration rates due to mixing of soil layers would affect the vegetative community. Vegetation reduces the impact of precipitation and assists in holding water in the soil in both uplands and riparian settings. Removal of the vegetation and replacement in reclamation will expose the soils to greater erosion over the course of operations. Within the stream channel vegetation filters sediment, provides shade and provides organic material for the system. Due to growth characteristics of different plant species it may take up to 30 years to reestablish the vegetative community currently existing after mining. The effects of vegetation removal would be moderate until the growth was re-established.

Riparian Areas: Alternative 1 would have the greatest impact on the riparian resources in the area due to the activities in 33 acres of riparian area. Vegetation would be removed from the areas, soil would be relocated and the channel shape and structure would be changed affecting the water available both surface and subsurface for vegetation in the areas. The removal of any large woody species (shrubs and trees) would reduce the shade provided by these plants and increase the temperature of the water where present and the rock where exposed.

Effects to water resources from this alternative would be major and would result in further evaluation for operations in the stream channel. The restoration of the channel alone would be an engineered operation and very costly.

e. Soils

Impacts common to all alternatives

Vegetation would be removed and excavation of soil and subsoil during mining activities prior to processing of paydirt material. The removal of vegetation would expose the soil to greater erosion for the period before reclamation is complete and vegetative cover is reestablished. In the process of removing the soil, layers would be separated and washed causing a change in texture, structure, and permeability creating an increase in the potential for erosion. The change in soil texture and composition would affect the establishment of vegetation on the reclamation sites.

Fords and Culverts: There are stream crossings in all alternatives which are either in the form of a ford or a culvert. Fords can contribute to erosion if they are not designed, and armored properly. This is primarily due to the wave action when water is present and the compaction and movement of bed material when dry. Culverts can focus sediment flows from road ditches into a stream channel. Alternative 1 would have the greatest impact to the soil resources associated with fords and culverts because of the heavy use of them.

Roads: Roads impact soils in the area under all alternatives by channeling water and snow melt and providing concentration points at culverts and fords for water and sediment. In addition, under dry conditions roads break up soil profiles and create dust. Table 2 provides a comparison of the amount of roads by alternative. Alternative 1 would have the greatest impact with close to 20 miles of road and an increase of personnel from 3 under a Notice to 8 employees in a Plan. The increase in personnel would result in additional traffic and use of the roads.

The effects to soils would be moderate for this alternative due to the remixing and the high potential for erosion, soil compaction, and disturbance of the natural layering of the soils.

f. Wildlife and Special Status Species

Assumptions common to all action alternatives

When analyzing effects, the following standards from the 2011 Draft RMP are used:

Negligible: Impacts on wildlife species would be at or below the level of detection, and the changes would be so slight that they would not be of any measurable or perceptible consequence to individuals or the population as a whole.

Minor: Impacts on wildlife species would be detectable but localized, small, and of little consequence to the population of any species. Mitigating measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Impacts on special status wildlife would be readily detectable and localized, with potential consequences at the population level. Mitigating measures, if needed to offset adverse effects, would be extensive and would probably be successful.

Major: Impacts on special status wildlife would be obvious and would result in substantial consequences to the populations in the region. Extensive mitigating measures would be needed to offset adverse effects, and their success would not be guaranteed. Actions that would likely result in effects to special status species of this severity would not be authorized or undertaken.

Sage-grouse

Alternative 1 would remove 247 acres of vegetation over a 20 year period. From studies conducted in the past, it has been concluded that a combination of ambient noise (e.g. processing sites) and the constant of flow of traffic may have detrimental negative effects on the nearby sage-grouse lek site and the birds that use this area for their life history needs (Blickley and Patricelli 2010; Barber et al. 2011; Blickley et al. 2012). To help mitigate the potential abandonment of the sage-grouse lek close to the operations and to minimize effects to habitat for sage-grouse, a habitat mitigation plan has been written and is included in Appendix E. This habitat mitigation plan would include mitigations based on the guidelines set forth in Oregon Revised Statute (ORS) 635-415-000. The proposed action without mitigations would have adverse impacts that would be moderate to major in magnitude.

Columbia spotted frog

Under the proposed action, the operator plans to mine about 33 acres within the Pine Creek channel. This alternative proposes to mine 300-500 foot sections along the Pine Creek channel. All mined portions would be reclaimed; however, vegetation and stream bank augmentation would potentially impact Columbia spotted frog habitat. Once the

area is reclaimed, resumed use of the site by frogs would occur; therefore, negative impacts to Columbia spotted frog habitat would be minor in magnitude.

Neotropical and Migratory birds
This alternative proposes the temporary removal of 247 acres of Neotropical and migratory bird habitat. The removal of vegetation would impact those species that are directly associated with that specific area. However, from Schmiegelow et al 1997 research concluded that bird colonies would collapse and recolonize with no decrease to habitat richness after fragmentation over the long-term. Mining operations would have to reclaim an area to pre-mining conditions. Once the area is reclaimed, resumed use of the bird habitat would occur; therefore, negative impacts to the habitat would be minor in magnitude.

Big Game and general wildlife
The scale of impact would be larger under the proposed action than Alternative 2. Mining and processing would take place on 247 acres of wildlife habitat. This would decrease the amount of wintering habitat that is available for big game and general wildlife. However, lands adjacent to the project area would support big game and general wildlife species habitat to assist in their lifecycle needs. Most wildlife would disperse into areas not being impacted by mining activity; as the area starts to be reclaimed and restored, wildlife would again start to inhabit the project area. Adverse impacts from the proposed action to big game and general wildlife habitat would be minor.

g. Socioeconomic Resources
The proposed action would improve the local economy; however, overall it would be minimal. The operator is proposing to hire 8 employees for 130 days of work per year for the duration of the project. This could be a steady job for 15-20 years while the operator is mining. The income of these 8 employees would go for housing, food, and other living expenses. Therefore, the hiring of employees for the duration of mining would directly and indirectly have positive effects on Baker County.

4.2 Alternative to the Proposed Action (Alternative #2)

a. Cultural and Historical Resources
Direct Effects
Alternative 2 effects would be the same as the proposed action, except cultural resources PC-1, PC-4 and PC-5 would be outside the project area and would not be impacted by the proposed mining project. Also, Sites PC-6, PC-9, BK_12_01 and OR BLM 509 would all be outside the project area and would not need to be buffered for protection from mining impacts. However, sites PC-2, PC-3, PC-7 and PC-8 would continue to be affected as described under the proposed action. PC-8 would continue to require a 20 meter buffer.

Overall impacts to cultural resources would be long-term and minor.

Indirect Effects
Indirect effects to cultural resources would be similar to the proposed action, except visual alterations to the landscape would be reduced by 33 acres. Also, traffic and noise would be somewhat reduced as Processing Sites #4, and #6 would be removed from the Plan.

Overall impacts would be long-term and minor to moderate.

b. Resources Important to Native American Tribes
Direct Effects
Traditional Plants: Alternative 2 would have the same direct effects as the proposed action, except 33 acres of riparian vegetation along Pine Creek would not be impacted. Overall impacts would be long-term and negligible to minor.

Wildlife Habitat: This alternative would have the same effects as the proposed action. However, this alternative would be slightly more beneficial because of the mitigation required to satisfy the sage-grouse component. (See Wildlife and Special Status Species section)

Access: Impacts to access under Alternative 2 would be the same as the proposed action, except Alternative 2 would not impact the access to the Pine Creek drainage and would result in 2.05 fewer miles newly created access roads. Impacts would be minor to moderate.

Indirect Effects
Traditional Plants: This alternative would have the same indirect effects to traditional plants as the proposed action.

Wildlife and Fish Habitat: There would be no indirect effects to wildlife habitat from Alternative 2.

Access: The indirect effects would be the same as the proposed action.

c. Noxious and Non-Native Invasive Plants
Direct Effects
Under this alternative, 98% of ground disturbing activities including 3 upland processing sites and mining on 209 upland acres would occur on High Bar ridge; the remaining 2% of ground disturbance would take place in a riparian area processing site located within the proposed Upper/Lower Pine Creek PoO. Existing weed infestations, particularly the Mediterranean sage on the ridge, cannot be avoided and will likely continue to spread, even with ongoing treatments. Direct impacts are expected to be site-specific, moderate, long-term, and adverse.

Excluding the riparian area from mining, the direct effects are the same as those described in the proposed action. However, compared with the proposed action,

Alternative 2 has less total mining acreage and processing site related ground disturbance, as well as fewer processing sites located in riparian areas.

BMPs, noxious and non-native invasive weed control, and reclamation efforts, which will occur concurrently with mining, are the same as those described in the proposed action.

Indirect Effects
Indirect effects are moderate, adverse, long-term, and site-specific. Effects will be similar to those described in the proposed action, but with 15.3 miles of existing roads and a corresponding ground disturbance for road widening at a maximum of 14 acres. The ATV maintenance road, as described in the proposed action, also applies to Alternative 2. Adverse impacts may be minimized by following Environmental Protection Measures (sections 2.1 (l) and 2.2 (l)) described in the proposed action and Alternative 2.

Transportation corridor miles and associated disturbance acres are slightly less than those listed for the proposed action and significantly more than those identified in Alternative 3 (see Table 2). Compared to the proposed action, the most overland travel will likely be concentrated in High Bar ridge area, rather than throughout both the ridge and valley bottom as would be the case in the proposed action. A processing site will be active in the valley bottom for water supply only, but minimal to no off road travel is expected.

d. Water Resources
Resources in the areas of Total Maximum Daily Load (TMDL), road drainage, water use, precipitation, and ground water all would be affected the same way by the mining operations for all alternatives.

Under Alternative 2 there would be 4 acres of the riparian area disturbed. This disturbance would have minimal impact due to the altered stream characteristics from the previous mining activities. Alternative 2 would keep the pipeline road use limited to ATV traffic, creating less use over the course of the operation. Alternative 2 has no additional processing sites in the valley bottom. Alternatives 1 and 2 would have the greatest potential to impact springs and wetlands in the area due to the disturbance on the ridgeline. Alternative 2 would not expand the operations in the riparian areas and would have minimal impacts to the riparian resources and water use.

e. Soils
The cumulative impacts of Alternative 2 would be the 217 acres on the ridge and withdrawing 33 acres in and along the valley bottom. Alternative 2 would have the greater impact than Alternative 3 due to more miles of road being utilized; the effects of more personnel and other equipment on site would have the same effects as the proposed action.

f. Wildlife and Special Status Species

Sage-grouse

The cumulative impacts to sage-grouse under Alternative 2 are similar to those analyzed under the proposed action, but on a lesser scale. Alternative 2 is only proposing to temporarily remove 209 acres of vegetation and would not be working in the Pine Creek channel. Therefore, adverse impacts from Alternative 2 to sage-grouse habitat would be moderate in magnitude.

Columbia spotted frog

Under Alternative 2 there is no proposed active mining within the Pine Creek channel; therefore, no negative impacts would affect Columbia spotted frog habitat. This alternative would have negligible effects to Columbia spotted frog habitat.

Neotropical and Migratory birds

Alternative 2 effects would be the same as those analyzed under the proposed action.

Big game and general wildlife

Alternative 2 effects would be the same as those analyzed under the proposed action. However, this alternative would be slightly more beneficial because of the mitigation which would benefit sage-grouse habitat.

g. Socioeconomic Resources

Alternative 2 would have the same employee base as the proposed action but for a shorter time, since the duration of mining in the area would be less due to a decrease in acreage. This alternative would have a positive indirect and direct benefit slightly less than the proposed action to the community and overall Baker County.

4.3 No Action Alternative (Alternative #3)

a. Cultural and Historical Resources

Direct Effects

No impacts would occur to cultural resources that are eligible or potentially eligible to the National Register of Historic Places (NRHP). Mining under the existing Notices (OR-66935, OR-67692 and OR-47530) would continue to occur, but ground disturbing activities would take place in areas where no significant or potentially significant resources occur.

Existing roads would be utilized and cross-country travel would avoid eligible or potentially eligible cultural resources with a twenty meter buffer. After the work on the pipeline was completed, site PC-8 was located by BLM staff. This site was missed during North Wind's 2011 cultural resource inventory. It is expected that the ATV road and pipeline would not impact site PC-8. However, because the eligibility of this site is undetermined, and the pipeline and ATV road are within the 20 meter buffer, BLM would monitor this site every six months during active mining to ensure impacts are not occurring. If in the future, it is determined during consultation, that PC-8 is not eligible for the NRHP, then BLM would discontinue monitoring activities and may remove the structure if necessary.

Overall impacts to cultural resources would be long-term and negligible to minor.

Indirect Effects
Indirect effects to cultural resources as a result of the No Action alternative would be short-term and minor. Environmental factors, including surface erosion and weather-related deterioration from the use of roads and use of water would continue to impact cultural resources in the project area. Noise, traffic and visible alterations to the landscape associated with mining under the Notices would continue to impact the area, but levels would be limited. New visual alterations to the landscape would be limited to 10 acres for the Notices. Noise and traffic from mining staff working the Notices would be at the lowest level of the 3 alternatives and would consist of approximately 1 to 3 vehicles, the operation of mining equipment at the 2 processing sites and operations of equipment at the 1 acre (or less) testing areas.

b. Resources of Importance to Native American Tribes
Direct Effects
Traditional Plants: Impacts to traditional plants under this alternative would be limited to 15 acres of disturbance. Overall impacts would be short-term and negligible.

Wildlife Habitat: The No Action alternative would temporarily remove 15 acres of vegetated wildlife habitat. Although the foot print of this alternative would be small, the ratio of disturbance would be larger, when associated with ambient noise due to processing the material. Adverse impacts to general wildlife species, as a resource of importance to Native American tribes, would be moderate in magnitude.

Big game within the area would most likely disperse to other areas for the duration of operations. Areas adjacent to the project area would support big game habitat for their lifecycle needs. Tribal members wanting to exercise their treaty rights would not utilize this area as much if the wildlife they disperse to other areas. Impacts from the No Action alternative would be negligible to minor in magnitude.

Access: Under this alternative, 15 acres would have restricted access during active mining. Impacts would be short-term and negligible.

Indirect Effects
Impacts for the No Action alternative would be short-term and negligible for traditional plants. There would be no indirect effects for wildlife habitat or access for tribal purposes.

c. Noxious and Non-Native Invasive Plants
Direct Effects
Operations are currently under Notices pursuant to 43 C.F.R. 3809, which allows small scale mining and the use of processing sites. No more than five acres, per Notice can be disturbed at a time for processing and mining. A total of 15 acres of disturbance is currently within the project area. Four of the 15 acres are riparian and concentrated at a

processing site in the draw next to Pine Creek, but no mining in the Pine Creek channel will occur. Under this alternative, the initial ground disturbance for creating the processing sites has already been completed and small scale exploration is ongoing. The direct effects of noxious and non-native invasive species are expected to be site-specific, minor, long-term, and adverse.

In comparison with Alternatives 1 and 2, this alternative has the least amount of ground disturbance in regards to mining activities. Processing will likely take place at on location the material is mined, which would minimize the potential for weed spread between the two Plans. BMPs, noxious and non-native invasive weed control, and reclamation efforts are the same as those described in the proposed action and Alternative 2 under Environmental Protection Measures (sections 2.1 (l) and 2.2 (l)).

Indirect Effects
Indirect effects under this alternative, under the Notices, would be minor, adverse, long-term, and site-specific. Even though mining related activity would be concentrated in and around Processing Sites #2 and #5, there are over 8 miles of ATV, public, and mining roads, which serve as a mechanism for weed spread (See Table 2). The required widening of roads for safety purposes would create an additional ground disturbance of approximately 6 acres. The impacts would be the same as those described in Alternatives 1 and 2 for the ATV pipeline maintenance road, but not as adverse due to less transportation corridor mileage and associated ground disturbance acreage. BMPs, noxious and non-native invasive weed control, and reclamation efforts would be the same as those described in the proposed action.

d. Water Resources
Under the No Action there would be 4 acres of the riparian area disturbed having a minimal impact due to the altered stream characteristics from the previous mining activities. Alternative 3, No Action, would keep the pipeline road use limited to ATV traffic. Under the No Action alternative, impacts would be similar for roads and soil compaction at a lesser scale to Alternative 2. Due to the disturbance of only 15 acres, the miles of roads would be much less than Alternatives 1 & 2, the utilization and disturbance of all areas would be less. Since there is less volume being processed the water use would not be nearly as great as Alternatives 1 & 2. Alternative 3 would not expand the operations in the riparian areas and would have minimal additional impacts to the riparian resources.

e. Soils
Alternative 3 would continue the current operations of 15 acres of mining disturbance. Therefore there would be little to no additional impact to the project area. Alternative 3 would continue at the current number of personnel with the same amount of traffic.

f. Wildlife and Special Status Species
Sage-grouse
Compared to action Alternatives 1 and 2, the No Action alternative has the least negative impacts to sage-grouse because of the amount of vegetation being cleared is 15 acres

total. However, because studies have shown that sage-grouse respond more negatively to ambient road noise, this alternative would still have moderate adverse impacts to sage-grouse.

Columbia spotted frog
Under the No Action alternative no mining would occur within the Pine Creek channel. Because no mining is being proposed in the stream channel, direct adverse effects would be negligible in the No Action alternative. However, indirect effects may occur if enough water is drawn from the wells to affect the water table causing the stream channel to dry up earlier in the year. If water is removed directly from Pine Creek this would indirectly effect and impact spotted frog habitat by removing water needed for the completion of life histories. However, pumping water to a transfer pond could also create additional habitat for Columbia spotted frogs. Depending on how the pond was created, the transfer pond could be beneficial in providing habitat for the spotted frog. Because there is a potential of limiting life histories and the creation of potential habitat, adverse impacts can range from minor to moderate in magnitude.

Neotropical and Migratory birds
Effects to Neotropical and migratory bird species would be site-specific. The level of activity occurring in the Notices would most likely temporarily displace any nesting and migrating birds within the area. However, as the site is reclaimed Neotropical bird and migratory bird species would most likely return and use the site. Schmiegelow documented that populations would collapse and recolonize with no decrease in species richness after habitat fragmentation. Brown 1971 and Schmiegelow et al. 1997 noted that short-term effects would most likely be major in occurrence; however, a decade after initial disturbance and recovery species richness of the site would be similar to pre-disturbed conditions. Under the No Action alternative, 5 acres of vegetation would temporarily be removed over the course of 2 years per Notice. Although the foot print would be small the ratio of disturbance would be larger when associated to ambient noise due to processing the material, adverse impacts to Neotropical and migratory bird species would be moderate in magnitude.

Big game and general wildlife
Effects for big game will be similar to what is analyzed under Neotropical and migratory birds. Big game within the area would most likely disperse to other areas. Areas adjacent to the project area would support big game habitat for their lifecycle needs. Adverse impacts from the No Action alternative to big game habitat would be negligible to minor in magnitude.

g. Socioeconomic Resources
The No Action alternative would keep the operations at the level they are currently. This alternative would not have any additional benefits to the local economy. The current operations are at a low enough level that if the operator was forced to continue at this level of exploration, they would abandon the project and the current employees would be out of jobs. The No Action alternative may have slightly negative direct and indirect effects to the local economy.

4.4 Cumulative Impact Analysis Including Past, Present, and Future Actions

Cumulative impacts are the effects on the environment that result from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

a. Evaluation of Potential Cumulative Impacts

Cultural Resources

Impacts to cultural resources in the past have occurred from unauthorized collection and excavation, and from inadvertent destruction of cultural resource sites and artifacts from mineral exploration and mining and other developments. Impacts from past mining actions were moderate to major in some areas; as mining has occurred to different degrees in the Pine Creek area since the 1880's. The majority of the cultural resources identified within the Pine Creek project area are associated with past mining episodes. Since the passage of the National Historic Preservation Act (NHPA) in 1966, most impacts from authorized actions have been avoided or mitigated and thus, impacts to cultural resources within the geographic scope of this project would be considered minor to moderate in the present.

Cumulative effects are expected to be minor to moderate. Mining projects on National Forest System lands to the north of the project area, Sundry Rooster Rock timber sale, and Baker Habitat fuels treatment could impact cultural resources; however, past or future compliances with Section 106 of the NHPA would mitigate any impacts to historic properties.

Increased activity and traffic from the projects above could increase surface erosion and impacts from human activity, such as collection. Cumulative effects could also result in an increase in noise and visible alterations to the landscape. This could impact historic properties if they are located within the viewshed and audible area of the propose projects and if the characteristics that make the properties eligible are affected by changes in the visual and audible environment. BLM is currently not aware of any historic properties that contain these characteristics in the area; however consultation is on-going.

Resources Important to Native American Tribes

Traditional Plants: Past and present actions including livestock grazing, road maintenance, mining activities, and general vehicle travel has resulted in changes to vegetation within the Pine Creek drainage. Past mining disturbance in the Pine Creek date back to the 1880-90s and these disturbances may have reduced or limited the relative abundance or potential for traditional plants to grow along Pine Creek today. The majority of the culturally significant plants identified during BLM plant surveys appears to be scattered around the project area and may be more abundant in other areas.

Restoration plans do not include many of the plant types traditionally utilized by the tribes. Therefore, it is likely that the area would continue to provide only small quantities

of the traditional plants needed to make this area desirable for resource gathering in the foreseeable future. Increased traffic and soil disturbance may require increased treatments for weeds or an increased frequency of weeds which can contribute to the existing lack of availability of the traditional plants.

Wildlife Habitat: The quality of wildlife habitat may have been impacted in the past by mining activities; however, the area has improved over time and currently provides a location where tribal members may choose to exercise their treaty rights.

Cumulative effects from the projects described above would cause additional noise and traffic. These disturbances would make the Pine Creek area less desirable for tribal members to exercise their treaty rights for hunting due to lack of wildlife from increased noise and activity.

Access: Past and present actions only would be limiting access to active mining operations for safety. Cumulative effects would be increased traffic, making access more difficult to the general public because of lack of adequate road maintenance.

Noxious and Non-Native Invasive Plants

Past and present land management actions have impacted the spread and establishment of noxious and non-native invasive weeds in the project area. Ground disturbing activities such as livestock grazing, road maintenance and mining activity have aided in weed establishment, while vectors such as general vehicle travel, wind, water, and domestic and wild animals serve as mechanisms for weed spread. In general, ground disturbing actions have resulted in adverse effects to vegetation, whereas integrated weed management techniques have resulted in beneficial effects that aid in supporting a native vegetative community.

An existing pipeline is located on adjacent lands administered by the U.S. Forest Service and will tie into Processing Site #1 on the ridge top. No additional soil disturbance is expected. As long as weed control and monitoring efforts continue, impacts to noxious and non-native invasive plants associated with pipeline maintenance and minimal off road travel are expected to be negligible.

Alternative 1: Cumulative effects are expected to be adverse and moderate to major, depending upon the success of controlling noxious and non-native weed spread and establishment. An integrated weed management approach, which considers multiple weed control methods such as biological, chemical, and manual, is necessary to reduce the risk of weed establishment and spread (Sheley and Petroff 1999). Aggressive and consistent control measures, as well as continuous monitoring, are necessary along transportation corridors and within reclamation areas.

Alternative 2: Cumulative impacts through the spread of noxious and non-native invasive weeds are expected to be adverse and moderate. These impacts are the same as those described in Alternative 1, but without the riparian area mining as described in the direct and indirect effects.

Alternative 3: Cumulative impacts through the spread of noxious weeds are expected to be adverse and minor due to a smaller area of upland and riparian disturbance when compared with Alternatives 1 and 2.

Water Resources

Water resources of the Pine Creek drainage have been affected by mining activities since the 1860s. These activities have altered the hydrology, stream channels, and uplands in the project area. The current operation covers roughly 15 acres or 0.3% of the Pine Creek drainage. The present operations continued the history of mining in the area. In addition to the mining activities, logging is occurring on the Forest Service lands north of the project area are using some of the same access roads as the proposed operations. This combined use increases the impacts to the roads and potential for greater erosion along the shared routes. The mining activity may increase or decrease. An increase would have to be addressed by the use of ground water to be used in the operation as there is no excess surface water to be used in the process.

Under Alternative1 there would be 247 acres of disturbance this is approximately 7.8% of the Pine creek watershed. Alternative 2 has 217 acres of disturbance or 6.6% of the watershed. Alternative 3 would disturb 15 acres and is 0.3% of the watershed. Less than 10% of the watershed is disturbed under all of the alternatives. The cumulative effects to the watershed as a whole would be limited. The cumulative impacts from this project in addition to the other projects in the watershed would be minor to moderate.

Wildlife and Special Status Species

Greater sage- grouse: The BLM used the 5 listing factors to identify past and present projects in which the USFWS believes to have adverse effects on sage-grouse habitat or population. The combined effect of past and present land management actions, on sage-grouse population has resulted in a stable to slightly negative population trend for lands (private and public) within the Baker Resource Area administrative boundary. This trend has been occurring since 1980 (ODFW 2011). The BLM expects that land management for all action alternatives (Alternatives 1 and 2) within this document would impact sage-grouse habitat and lek site.

Columbia spotted frog: Past mining actions have augmented water within the channel within Pine Creek. Some of these augmentations have created Columbia spotted frog habitat in the form of ponds which hold water year round. The Pine Creek stream channel is proposed to be mined under the proposed action, but not under Alternative 2. The Notice activities in Alternative 3 have created potential spotted frog habitat in the form of a lined transfer pond.

Neotropical and migratory bird species: Past actions from mining have changed the type of habitat found throughout project area. However, the proposed mining area on the ridge is suitable to provide nesting and breeding habitat for Neotropical and migratory bird species. The BLM suspects that past mining activities have had minor adverse effects and would continue to have the same effects.

Big game and general wildlife: This area is within critical wintering habitat for mule deer and elk. Although largely restored, past mining operations would be the largest past land action that have impacted the habitat for big game wintering.

Present actions for all wildlife: Present actions within the project area have augmented habitat for all wildlife species that inhabit the project area. Augmentations have been both beneficial and detrimental depending on specific circumstances. For example, past mining activity in the channel has helped to create more areas that are suitable for spotted frogs to breed and carry out life histories. However, the removal and processing of mined material may displace the wildlife which depend on the project area for food, cover, and shelter the essentials of wildlife survival. Current condition of the ridge is good ecological condition and supports several wildlife species.

A reasonably foreseeable action is the potential ruling by USFWS in 2015 to list sage-grouse under the Endangered Species Act. This will significantly change how and what can be done in sage-grouse habitat. The projects which are reasonably foreseeable within the Pine Creek drainage area could create higher noise levels because of increased travel on the county road 731 and highway 245.

Visual Resources

Past and present actions affecting visual resources within the project area have included mining activities and primitive road/trail development, most of which were associated with previous mining activities. The impacts of these past actions have changed the existing landscape of the public lands as well as the adjacent private lands through the disturbances created by mining operations. Although the actions and impacts from these operations, both past and present, have modified the public lands, those impacts do not dominate the landscape, nor are they noticeable by the casual observer. All actions past and present are consistent with the Visual Resource Management (VRM) Class III/IV designations for the area as well as the Visual Resource Inventory (VRI) of those lands, and no cumulative impacts to the landscape views of the area from these actions have occurred.

For the visual resources associated with the proposed mining area, it is reasonable and foreseeable that the mining operation would have some impact to the visual expectation of the users of the immediate area for the 20 years of estimated duration of operations. Long term affects to visuals would be mitigated by reclamation efforts. Additionally, the VRI and VRM determinations associated with the 2012 Baker Draft Resource Management Plan continue to classify this area as VRM Class III or Class IV (depending on the final alternative selected) and therefore visual impacts from the proposed activities would not degrade any identified visual area not would it violate any assigned visual management objective.

Access

Past and present use of the proposed project area have created a variety of developed roads as well as user created trails in conjunction with county and BLM road systems and

general public use of public lands. A number of these user created primitive roads/trails resulted from the use of OHV's and the designated "OPEN" classification for off-road vehicle uses assigned to the area. Although not an area of concentrated public use, the road and trail systems have provided the ability for exploration and recreational pursuits by public land users. Although the development and addition of these access routes has added to the overall route network of the BLM lands within the Baker Resources Area, the overall cumulative effects of these past and present actions has been negligible.

With the incorporation of inventoried roads, primitive roads and trails contained within the Baker IRN, and the reclamation of any of those routes impacted by the mining operation to pre-mining condition, there are no detrimental foreseeable actions on access resulting from this project. Some required safety restrictions of specific routes might affect the normal travel routine by users of the area however the overall uses of the BLM lands would not be affected. Access in the short to moderate timeframes would have negligible impacts with no long term or future impacts anticipated.

Reasonably foreseeable actions take into account all the activities in and around the project area which have been proposed and are going to be approved in the foreseeable future. There are two active existing placer mines upstream from the project area on National Forest System lands. These two mining projects are similar in activities to the project being evaluated, however are on a much smaller scale. There is also a large timber sale being done on National Forest System lands called Sundry-Rooster Rock and has caused some higher than normal traffic on the county road. On the BLM there is a proposal to do a lot of phase 1 juniper eradication cutting in and around the project area under the Baker Habitat fuels treatment.

Summary of cumulative effects
The cumulative effects for this project have a great deal to do with the upcoming RMP for the Baker Resource Area. At that time, the goals and stipulations under some critical elements may need to be re-evaluated. There a fuels treatment project on the BLM, mining is occurring both upstream on National Forest System lands and downstream on private lands adjacent to either end of the project area, and there is a timber sale going on currently on the Forest Service managed lands.

b. Unavoidable Adverse Effects
As with all alteration of material there are unavoidable adverse effects to soil from separation of materials from a defined matrix. The potential swell factor from excavations in situ may require additional seeding acreage due to the extra loosely packed material.

c. Relationship of Short-Term Uses and Long-Term Productivity
No effects related to this project were identified that were not disclosed in the Baker Resource Area Management Plan. The desired future condition of the project area will dictate the standards to which the operator would need to accomplish to have the financial guarantee returned.

d. Irreversible and Irretrievable Commitments of Resources
Valuable minerals on BLM managed lands are a limited resource and consumed by the operators. The commitment of valuable minerals is irretrievable and irreversible. This commitment of minerals is allowed under the 1872 Mining Law and is addressed as a goal in the Resource Management Plan for the Baker Resource Area.

e. Potential Conflicts with Plans and Policies of Other Agencies: Implementation would not result in any conflicts with other agencies. The operators are required to follow all Federal, state and local laws and regulations in order to implement their operations. The BLM has also coordinated all permitting and other issues closely with involved agencies.

f. Energy Requirements: There would be no unusual energy requirements for implementing any alternative.

5.0 CONSULTATION AND COORDINATION

5.1 Agencies Consulted

Oregon Department of Fish and Wildlife
Oregon State Historical Preservation Office
Oregon Department of Environmental Quality
Confederated Tribes of the Umatilla Indian Reservation
U.S. Fish and Wildlife Service
Baker Water Resources Department
Burns Paiute Tribe

5.2 Interdisciplinary Team Members

Margaret Doolittle	Team Lead/Geologist
Melissa Yzquierdo	Wildlife Biologist/Botanist
Kevin McCoy	Visuals/Recreation/Access
Katy Coddington	Archeologist/Tribal Liaison
Gary Guymon	Range Management
Sam Cisney	Noxious Weeds and Non-Native Plant Species
John Quintela	Fisheries
Linus Meyer	Water Resources/Soils
Mike Woods	Climate Change

6.0 REFERENCES

a. Cultural and Historical

Burnt River History Group. 2007. *Lest We Forget: Remembrances of Upper Burnt River in Baker County Oregon.*

Fowler, Catherine and Sven Liljeblad. 1986. "Northern Paiute." In Great Basin, Warren D'Azevado, ed. *Handbook of North American Indians* 11: pp. 435-465. Smithsonian Institution, Washington, D.C.

Murphy, Robert F. and Yolanda Murphy. 1986. "Northern Shoshone and Bannock". In Great Basin, Warren D'Azevado, ed. *Handbook of North American Indians* 11: pp. 284-307. Smithsonian Institution, Washington, D.C.

Stern, Theodore. 1998. "Cayuse, Walla Walla, and Umatilla." *Handbook of North American Indians, Vol. 12: Plateau*. Deward E. Walker, Jr., editor. Smithsonian Institution Press, Washington D.C.

Walker, Deward E., Jr. 1998. *Handbook of North American Indians, Vol. 12: Plateau*. Editor. Smithsonian Institution Press, Washington D.C.

b. Wildlife

Aldridge L. Cameron, Scott E. Nielsen, Hawthorne L. Beyer, Mark S. Boyce, John W. Connelly, Steven T. Knick and Michael A. Schroeder. 2008. Range-Wide Patterns of Greater Sage-Grouse Persistence. Diversity and Distributions. Vol. 14, No. 6, pp. 983-994

Aldridge L. Cameron and Mark S. Boyce. 2007. LINKING OCCURRENCE AND FITNESS TO PERSISTENCE: HABITATBASED APPROACH FOR ENDANGERED GREATER SAGE-GROUSE. Ecological Applications, 17(2), pp. 508–526

Barber Jesse, Chris Burdett, Sarah Reed, Katy Warner, Charlotte Formichella, Kevin Crooks, Dave Theobald, and Kurt M Fristrup. 2011. Anthopogenic noise exposure in protected natural areas: estimating the scale of ecological consequences. Landscape Ecology 26:1281-1295

Beck L. Jeffrey and Dean L. Mitchell. 2000. Influences of Livestock Grazing on Sage Grouse Habitat. Wildlife Society Bulletin, Vol. 28, No. 4, pp. 993-1002

Bruan Clait, Tim Britt, and Richard Wallestad. 1977. Guidelines of Maintenance of Sage Grouse Habitats. Wildlife Society Bulletin. Vol. 5 No. 5 pp. 99-106

Braun, S. Dwight Bunnell, John W. Connelly, Pat A. Deibert, Scott C. Gardner, Mark A. Hilliard, Gerald D. Kobriger, Susan M. McAdam, Clinton W. McCarthy, John J. McCarthy, Dean L. Mitchell, Eric V. Rickerson, and San J. Stiver. 2005. DISTRIBUTION OF SAGE-GROUSE IN NORTH AMERICA. The Condor, 106(2):363-376.

Blinkley Jessica, Diane Blackwood, and Gail Parricelli. 2012. Experimental Evidence for the Effects of Chronic Anthropogenic Noise on Abundance of Greater Sage-Grouse at leks. Conservation Biology. Vol. 26 No. 3, 461-471

Blickley Jessica and Gail Patricelli. 2010. Impacts of Anthropogenic Noise on Wildlife: Research Priorities for the Development of Standards and Mitigation. Journal of international Wildlife Law and Policy. 13:274-29

Bull, Evelyn and Mark Hayes. 2002. Overwintering of Columbia Spotted Frogs in Northeastern Oregon. Northwest Science vol. 76, no. 2

Bull, Evelyn and Mark Hayes. 2001. Post-breeding Season Movement of Columbia Spotted Frogs (Rana luterventris) in Northeastern Oregon. Western North American 61(1) pg. 119-123.

Connelly, J. C., Knick, S.T., Schroeder, M. A., & Stiver, S.J. 2004. Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats., USDI, U.S. Fish and Wildlife Service.

Connelly JW and CE Braun. 1997. Long-term changes in sage grouse Centrocercus urophasianus populations in western North America . Wildlife Biology. Vol. 3, no. 3-4, pp. 229-234

CONNELLY, J.W., S.T. KNICK, C.E. BRAUN, W.L. BAKER, E.A. BEEVER, T. CHRISTIANSEN, K.E. DOHERTY, E.O. GARTON, C.A. HAGEN, S.E. HANSER, D.H. JOHNSON, M. LEU, R.F. MILLER, D.E. NAUGLE, S.J. OYLER-McCANCE, D.A. PYKE, K.P. REESE, M.A. SCHROEDER, S.J. STIVER, B.L. WALKER, AND M.J. WISDOM. IN PRESS (2011). Conservation of Greater Sage-Grouse: a synthesis of current trends and future management. In S. T. Knick and J. W. Connelly (editors). Greater Sage-Grouse: Ecology and conservation of a landscape species and its habitats. Studies in Avian Biology Series (vol. 38)

Connelly W. John Michael, A. Schroeder, Alan R. Sands, Clait E. Braun. 2000. Guidelines to Manage Sage Grouse Populations and Their Habitats. Wildlife Society Bulletin, Vol. 28, No. 4, pp. 967-985

Crawford, J.A., Olson, R.A., West, N. E., Mosley, J. C., Schroeder, M. A., Whitson, T.D., Miller, R.F., Gregg, M.A., & Boyd, C.S. 2004. Synthesis paper ecology and management of sage-grouse and sage-grouse habitat. Journal of Range Management: Vol 57 (1).

Funk W. Chris, Michael S Bloubin, Paul Stephen Corn, Bryce A Maxell, David S. Pilliod, Steven Amish, and Fred w. Allendorf. 2005. Population structure of Columbia spotted frogs (Rana luteiventris) is strongly affected by the landscape. Molecular Ecology 14, 143-496

Karl, M. & Sadowski, J. 2005. Assessing big sagebrush at multiple spatial scales: An example in southeast Oregon. Technical Note 417 BLM/ST/ST-05/001+4400. Denver, CO: Bureau of Land Management.

Knick, S. T., and J. W. Connelly Monographs editors). 2011. Greater Sage-Grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian Biology Series (vol. 38), University of California Press, Berkeley, CA.

Maser, C., Thomas, J.W., & Anderson, R.G. 1984. Wildlife habitats in managed rangelands—the Great Basins of southeastern Oregon: The relationship of terrestrial vertebrates to plant communities and structural conditions. General Technical Report PNW-172. USDA, Forest Service, Pacific Northwest Forest and Range Experiment Station.

Oregon Department of Fish and Wildlife. 2011.Greater Sage-Grouse conservation assessment and strategy for Oregon: A plan to maintain and enhance populations and habitat. Salem, OR: Oregon Department of Fish and Wildlife

Schmiegelow Fiona, Craig Machatans, and Sysyab Hannon. 1997. Are boreal Birds resilient to forest fragmentation? An experimental study of short-term community responses. Ecology pp.1914-1932

Schroeder A. Michael, Cameron L. Aldridge, Anthony D. Apa, Joseph R. Bohne, Clait E. Braun, S. Dwight Bunnell, John W. Connelly, Pat A. Deibert, Scott C. Gardner, Mark A. Hilliard, Gerald D. Kobriger, Susan M. McAdam, Clinton W. McCarthy, John J. McCarthy, Dean L. Mitchell, Eric V. Rickerson, and San J. Stiver. 2004.DISTRIBUTION OF SAGE-GROUSE IN NORTH AMERICA. The Condor, 106(2):363-376.

STIVER, S.J., E.T RINKES, AND D.E. NAUGLE. 2010. Sage-grouse Habitat Assessment Framework. U.S. Bureau of Land Management. Unpublished Report. U.S. Bureau of Land Management, Idaho State Office, Boise, Idaho.

USDI Bureau of Land Management. 1989a. Baker resource management plan record of decision. Baker City, OR: Vale District BLM, Baker Resource Area.

USDI Bureau of Land Management. 2004a. Guidance for addressing sagebrush habitat conservation in BLM land use plans. Washington, DC: United States Department of the Interior.

USDI Bureau of Land Management. Instruction Memorandum No. OR-2008-038. Final State Director's Special Status Species List. Oregon/Washington OR 931 Branch of Biological Sciences

USDI Bureau of Land Management. 2012. Greater Sage-Grouse Interim Management Policies and Procedures. Washington, D.C. United States Department of Interior.

Welch Nathan E and James A MacMahon. 2005. Identifying Habitat Variables Important to the Rare Columbia Spotted Frogs in Utah (USA): an Information-Theoretic Approach. Conservation biology Vol. 19 no. 2 pg 473-481

b. Geology and Soils

GEOLOGY

Orr, Elizabeth L., and William N. Orr. 2000. Geology of Oregon. *Fifth edition.* Pages 21-28. Kendall/Hunt Publishing Company. Dubuque, Iowa.

SOILS

Natural Resource Conservation Service, United States Department of Agriculture, Soil Data Mart (http://soildatamart.nrcs.usda.gov/) website which provides tabular and spatial data from the Baker County Area, Oregon (OR604) soil survey and the Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey website (http://websoilsurvey.nrcs.usda.gov/ accessed [June 13 – 17, 2011]). Both websites are related and contains only the "current" version of official data.

United States Department of Agriculture, Natural Resources Conservation Service and Forest Service, in cooperation with the United States Department of the Interior, Bureau of Land Management and the Oregon Agricultural Experiment Station, Soil Survey of Baker County Area, Oregon, issued June 1997. (http://soildatamart.nrcs.usda.gov/Manuscripts/OR604/0/or604_text.pdf)

d. Water Resources

Bliss, Timothy, High Bar Placers and Pine Creek Placers Watershed Existing Report, Bliss Enterprises LLC, January 11, 2012.

Easterbrook, D.J. 1969b. Principles of Geomorphology. McGraw-Hill, Inc. p. 148.

Corps of Engineers Wetland Delineation Manual, Final Report, Environmental Laboratory 1987 (Wetlands Research Program Technical Report Y-87-1 online edition)

Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey website (http://websoilsurvey.nrcs.usda.gov/ [accessed June 13 – 17, 2011].

Nieves, Lizandra, OR-63719/OR-60224 Water/Soil/Wetlands report USDI BLM Oregon Baker Field Office 2011.

Ritter, D.F., Kochel, R.C., Miller, J.R., 1995, Process Geomorphology, Third Edition, William C. Brown Publishers, Dubuque, IA.

Rosgen, Dave, Applied River Morphology, Wildland Hydrology, 1481 Stevens Lake Road, Pagosa Springs Colorado 1996.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil survey of Baker County Area, Oregon (OR604) [Online WWW]. http://soildatamart.nrcs.usda.gov/ [accessed June 13 – 17 and July 8, 2011].

Schoeneberger, P.J., Wysocki, D.A., Benham, E.C., and Broderson, W.D. (editors), 2002. Field book for describing and sampling soils, Version 2.0. Natural Resources Conservation Service, National Soil Survey Center, Lincoln, NE.

Schwab, Glenn O., Delmar D. Fangmeier, William J. Elliot, & Richard K. Frevert. 1993, Soil and Water Conservation Engineering, Fourth Edition, John Wiley and Sons, Inc.

U. S. Fish and Wildlife Service. Publication date (February 4, 2011). National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/.

U.S. Geological Survey. Publication date (April 21, 2010). National Hydrography Dataset. U.S. Department of the Interior, Geological Survey, Reston, Virginia. http://nhd.usgs.gov/index.html.

USDA-Natural Resource Conservation Service, 2010. Field Indicators of Hydric soils in the United States, A Guide for Identifying and Delineating Hydric Soils, Version 7.0 (indicators under the land resource region B-Northwestern Wheat and Range Region)

USDA-Natural Resource Conservation Service, Plants Database, Region 9 Wetland Indicator Status. http://plants.usda.gov/java/wetland?wet_region=nwi_r9&sort=sciname&format=print

e. Noxious and Non-Native Invasive Plants

DiTomaso, J. M. 2000. Invasive Weeds in Rangelands: Species, Impacts, and Management. *Weed Science*. 2000, 48(2): 255-265. Weed Science Society of America.

Larson, L., M. McInnis, and G. Kiemnic. 1997. Rangeland Weed Invasion. *Rangelands*. 19(3).

Sheley, R. and J. Petroff. 1999. Biology and Management of Noxious Rangeland Weeds. Oregon State University Press: Corvallis, OR. Pp 69-72.

U.S. District Court injunction issued in Northwest Coalition for Alternatives to Pesticides, et al. v. Block, et al. (Civ. No. 82-6273-E). 1987.

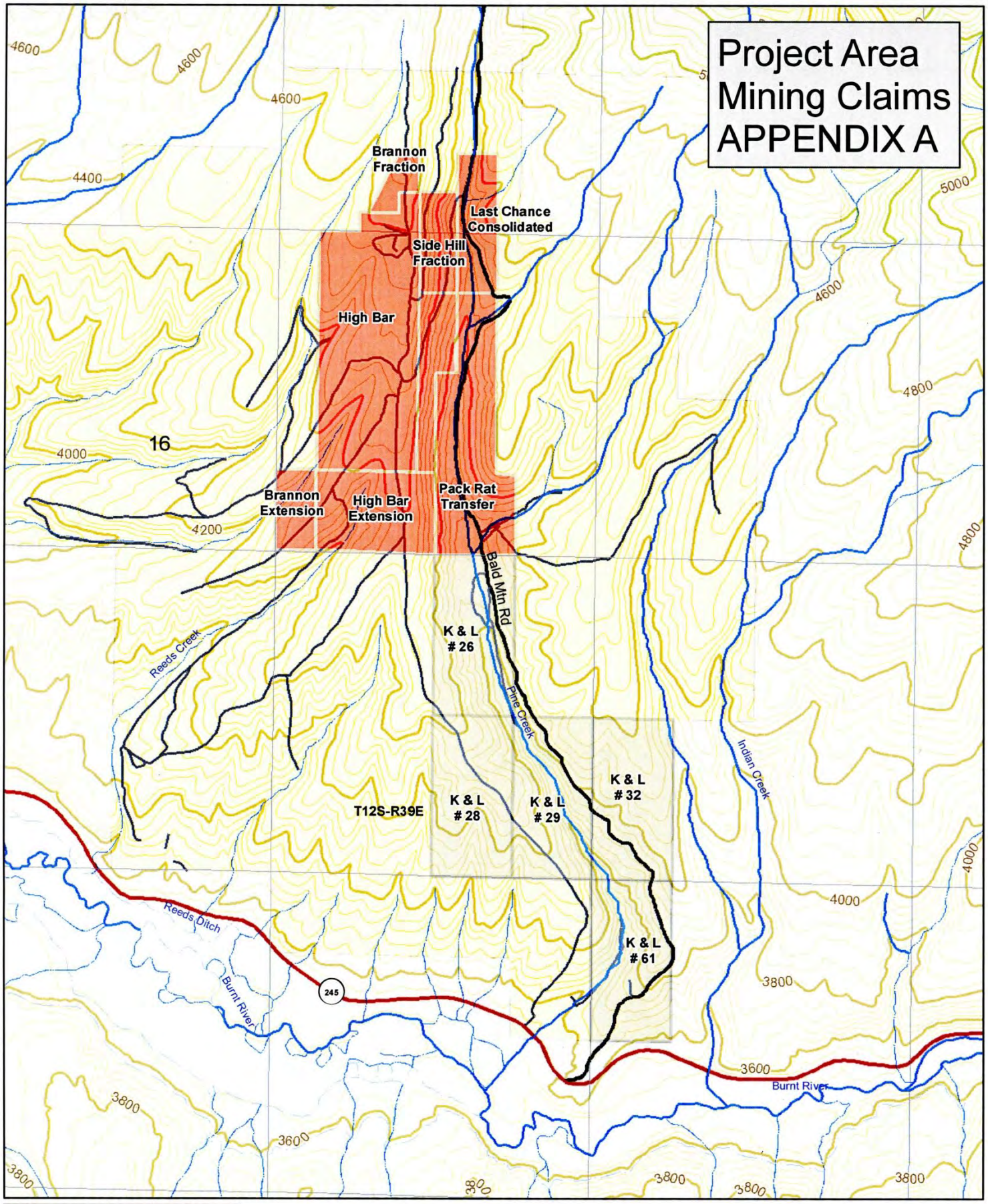
U.S. Department of the Interior, Bureau of Land Management. 2010. Vegetation Treatments Using Herbicides on BLM Lands in Oregon FEIS. Washington, D.C.

Zimdahl, R. 2007. Fundamentals of Weed Science. Academic Press, Inc. San Diego, CA. Pp. 16-17.

f. Other Resources Evaluated

Baker County information: Wikipedia, Baker County, website accessed 1/17/2013: http://en.wikipedia.org/wiki/Baker_County,_Oregon

Project Area Mining Claims APPENDIX A



High Bar Claims
Upper/Lower Pine Creek Claims
Roads
County Route (public)
Public Road
STREAMS
Perennial
Intermittent/seasonal
Other Drainages
OWNERSHIP
Bureau of Land Management
U.S. Forest Service
Private

1:24,000

0 0.175 0.35 0.7 Miles

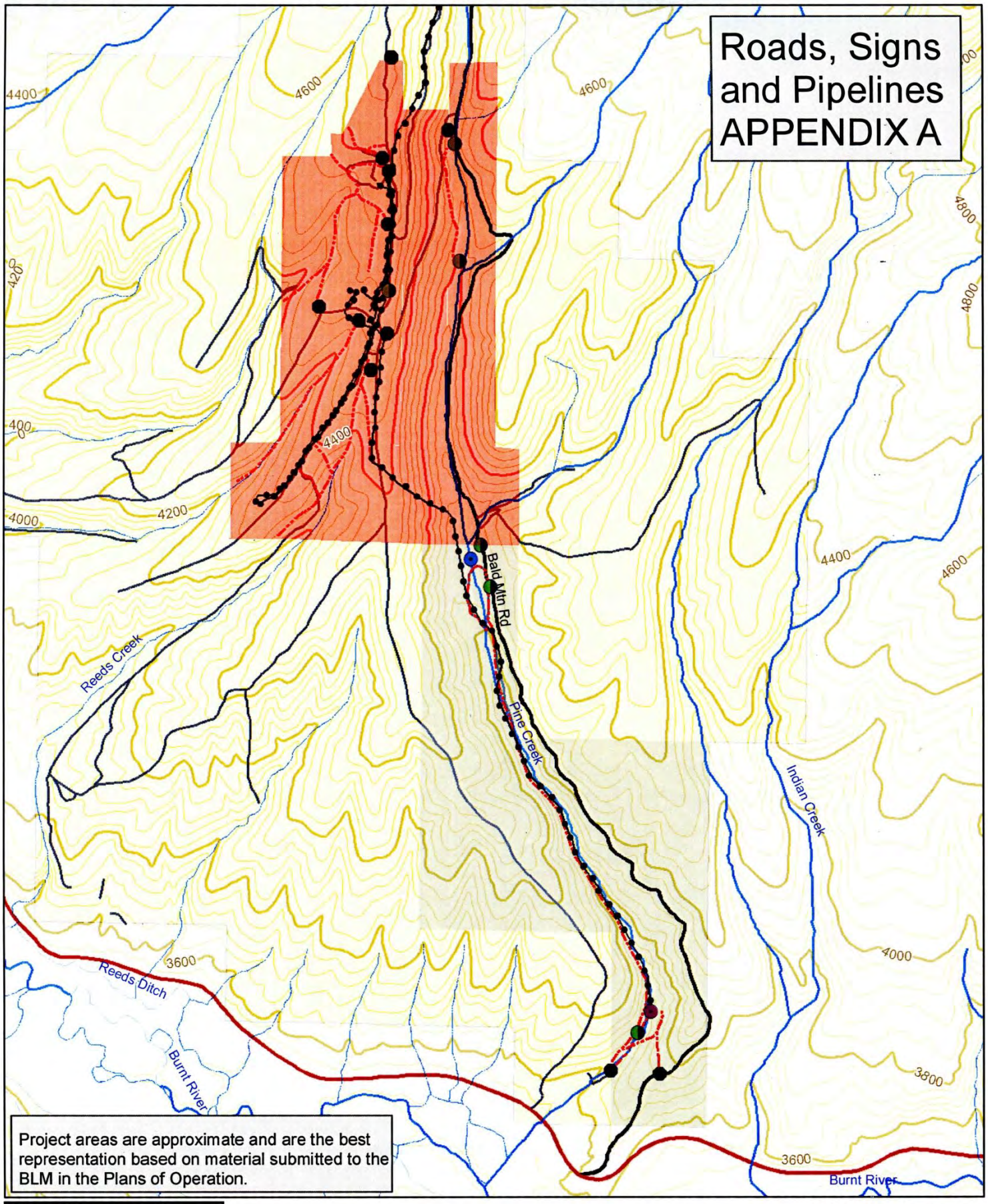
Oregon

High Bar/ Upper and Lower Pine Creek Mining Project

No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for ndividual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

March 13, 2013

Roads, Signs and Pipelines APPENDIX A



Project areas are approximate and are the best representation based on material submitted to the BLM in the Plans of Operation.

Sign
Sign and Gate
Well #1
Well #2

Claims
High Bar PoO
Lower/Upper Pine Creek PoO
Pipeline
Mining Road

Roads
County Route (public)
Public Road

STREAMS
Perennial
Intermittent/seasonal
Other Drainages

OWNERSHIP
Bureau of Land Management
U.S. Forest Service
Private

1:20,000

0 0.15 0.3 0.6 Miles

Oregon

High Bar/ Upper and Lower Pine Creek Mining Project

No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for ndividual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

March 13, 2013

Alternative 1
APPENDIX A

Mining Site #1
Mining Site #3c
Processing Site 1
Mining Site #3b
Processing Site 2
Mining Site #2
Mining Site #3a
Processing Site 3
Processing Site 4
Mining Site #5
Processing Site 5
Bald Mtn Rd
Mining Site #4
Mining Site #6
Reeds Creek
Pine Creek
Mining Site #7
Indian Creek
Reeds Ditch
Processing Site 6
Mining Site #8
Burnt River
Mining Site #9
Burnt River

4400
4600
4400
4200
4000
4600
4800
4800
4400
4600
4000
3600
3800
3600

Project areas are approximate and are the best representation based on material submitted to the BLM in the Plans of Operation.

Name
Well #1
Well #2
Processing_Sites
Mining Sites
Mining Road
Roads
County Route (public)
Public Road

STREAMS
Perennial
Intermittent/seasonal
Other Drainages

OWNERSHIP
Bureau of Land Management
U.S. Forest Service
Private

1:20,000

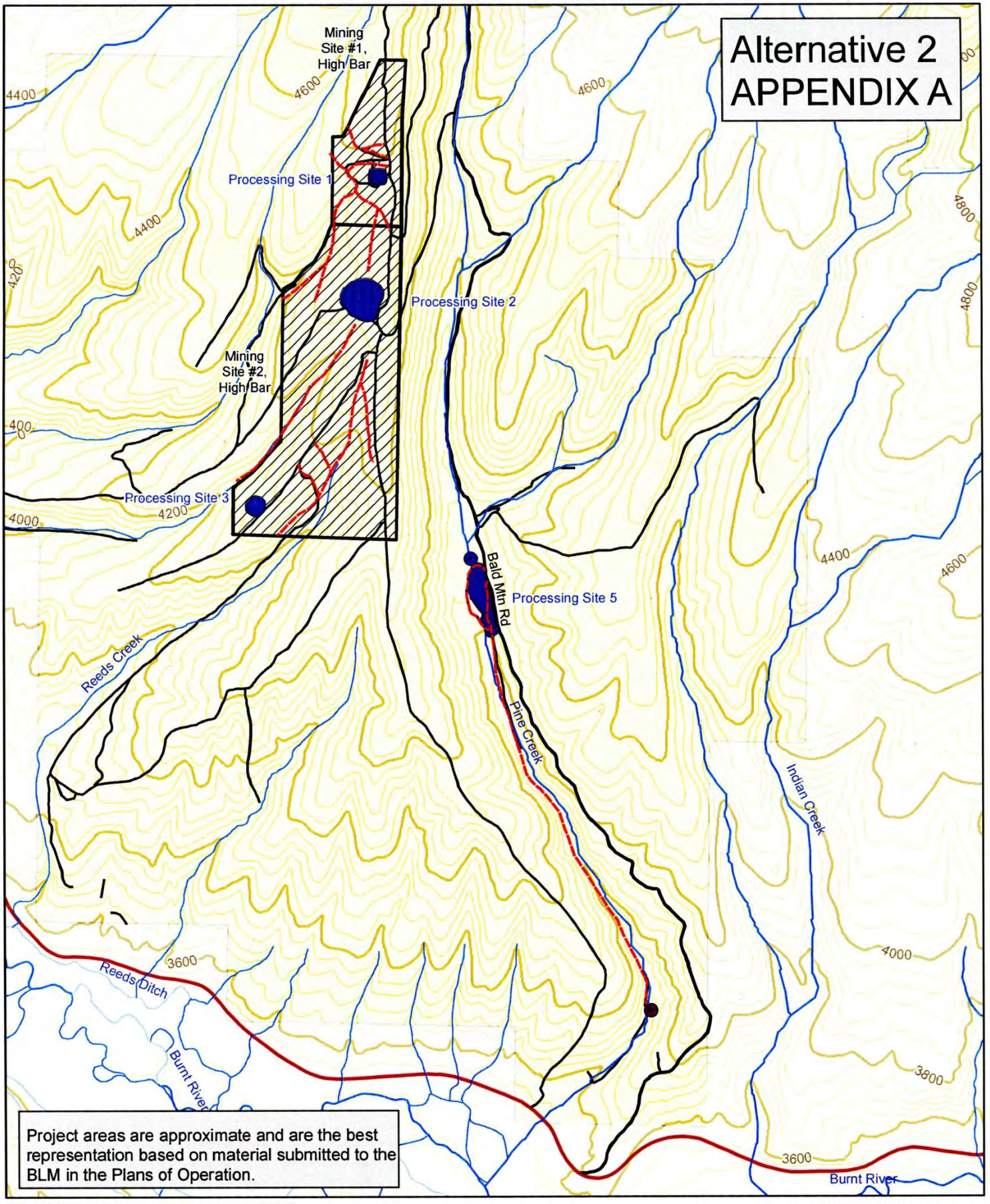
0 0.15 0.3 0.6 Miles

Oregon

High Bar/ Upper and Lower Pine Creek Mining Project

No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for ndividual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

March 13, 2013



Name
Well #1
Well #2
Processing_Sites
Mining Sites
Mining Road
Roads
County Route (public)
Public Road
STREAMS
Perennial
Intermittent/seasonal
Other Drainages
OWNERSHIP
Bureau of Land Management
U.S. Forest Service
Private

1:20,000

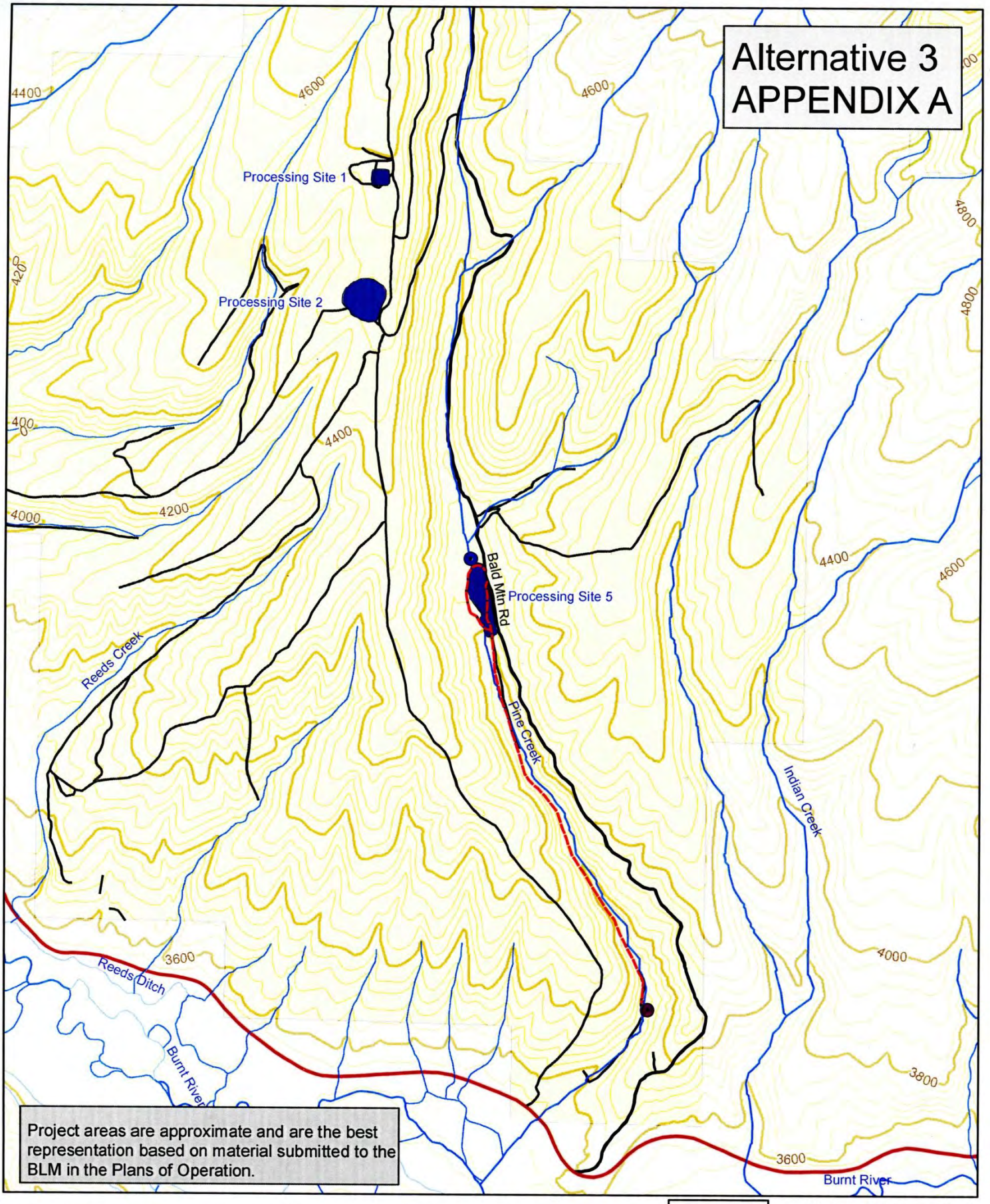
0 0.15 0.3 0.6 Miles

Oregon

High Bar/ Upper and Lower Pine Creek Mining Project

No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for ndividual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

March 13, 2013



Well #1
Well #2
Processing_Sites
Mining Road
Roads
County Route (public)
Public Road
STREAMS
Perennial
Intermittent/seasonal
Other Drainages
OWNERSHIP
Bureau of Land Management
U.S. Forest Service
Private

1:20,000

0 0.15 0.3 0.6 Miles

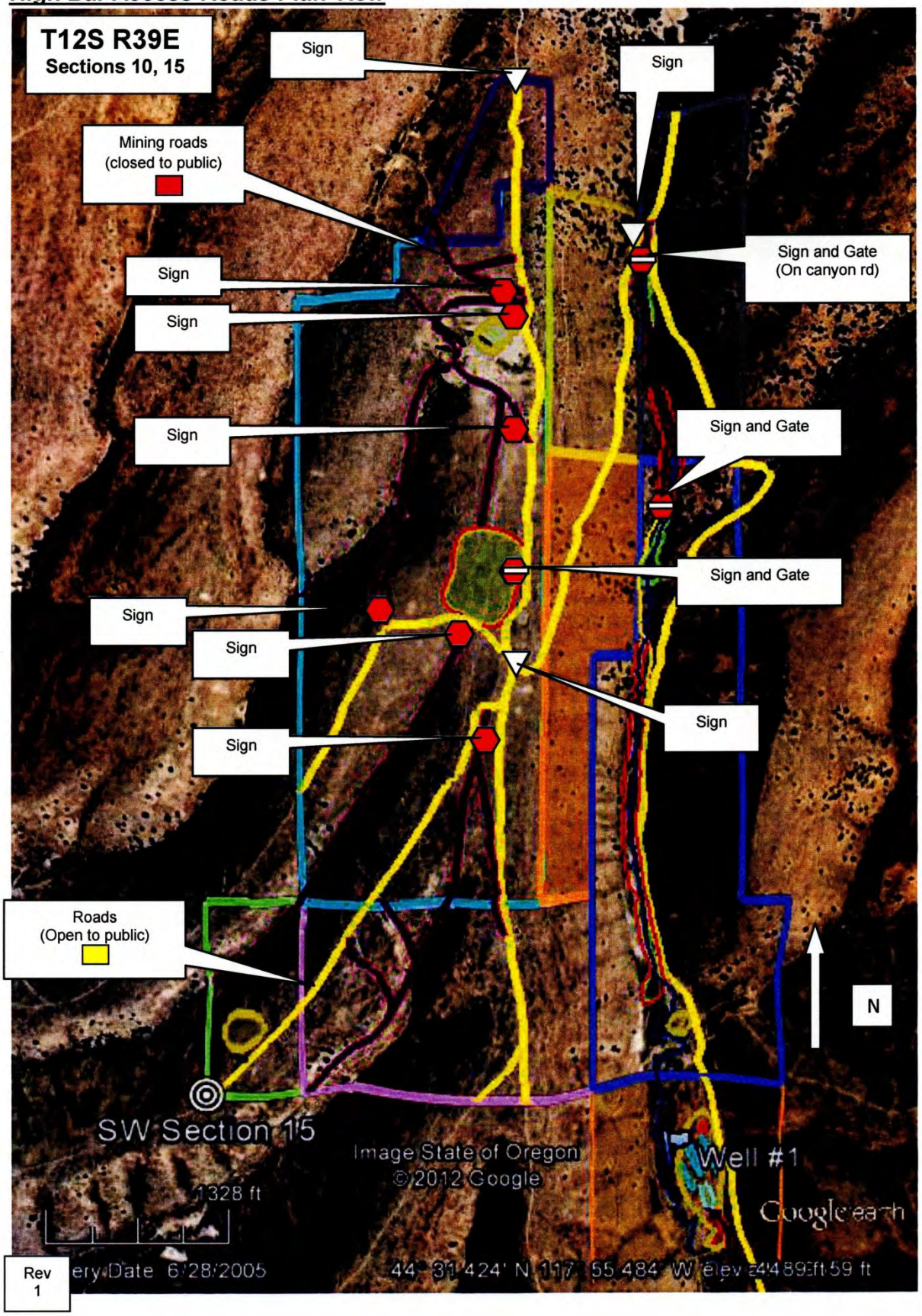
Oregon

High Bar/ Upper and Lower Pine Creek Mining Project

No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for ndividual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

March 13, 2013

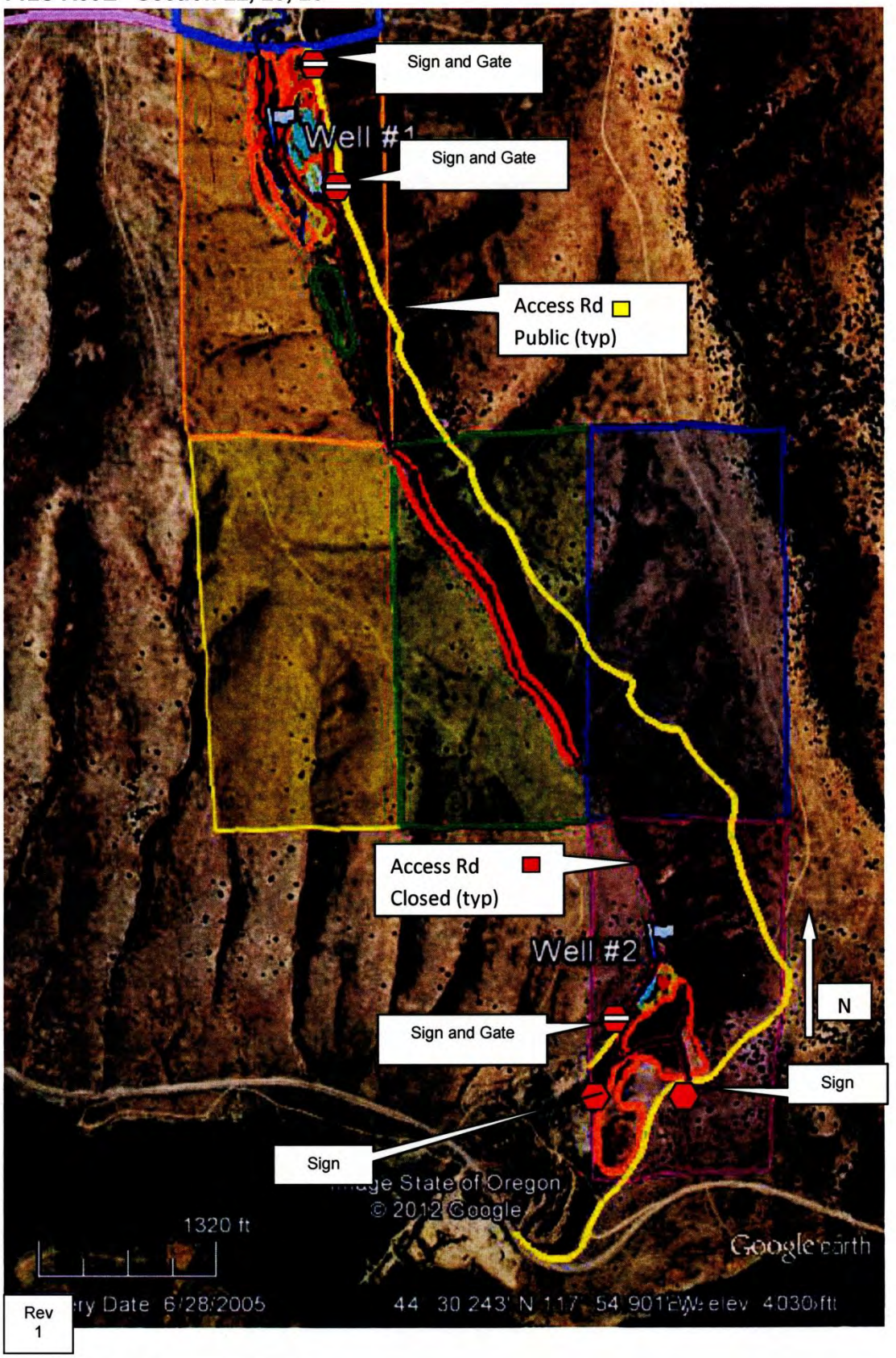
High Bar Access Roads Plan View



File: Pine Creek High Bar Mining Claims Map R9 042312 r1

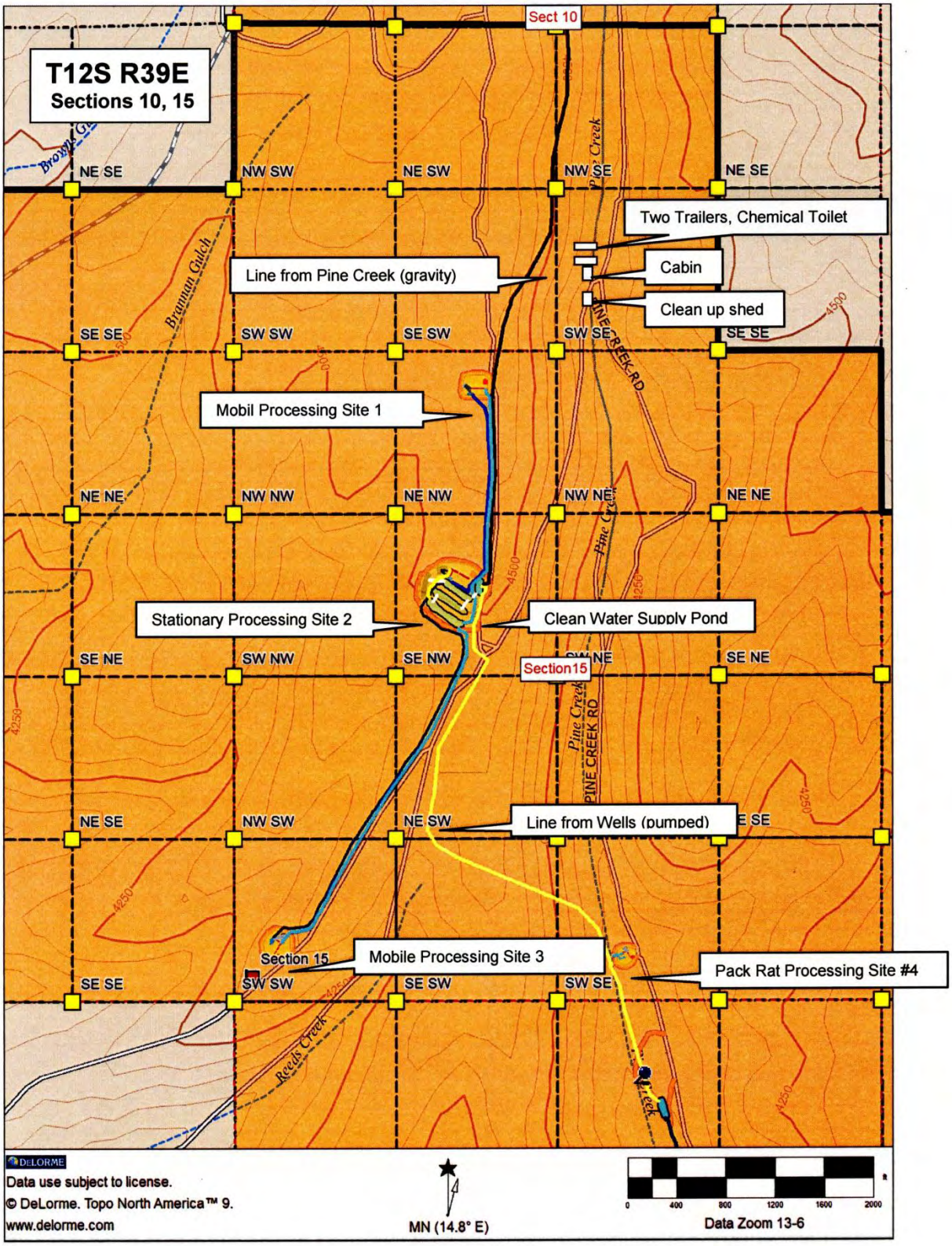
Lower Pine Creek Mining Sites Access

T12S R39E –Section 22, 23, 26



File: Pine Creek Upper And Lower Claims Maps R9 042212 r2 r2

High Bar Processing Sites and Infrastructure



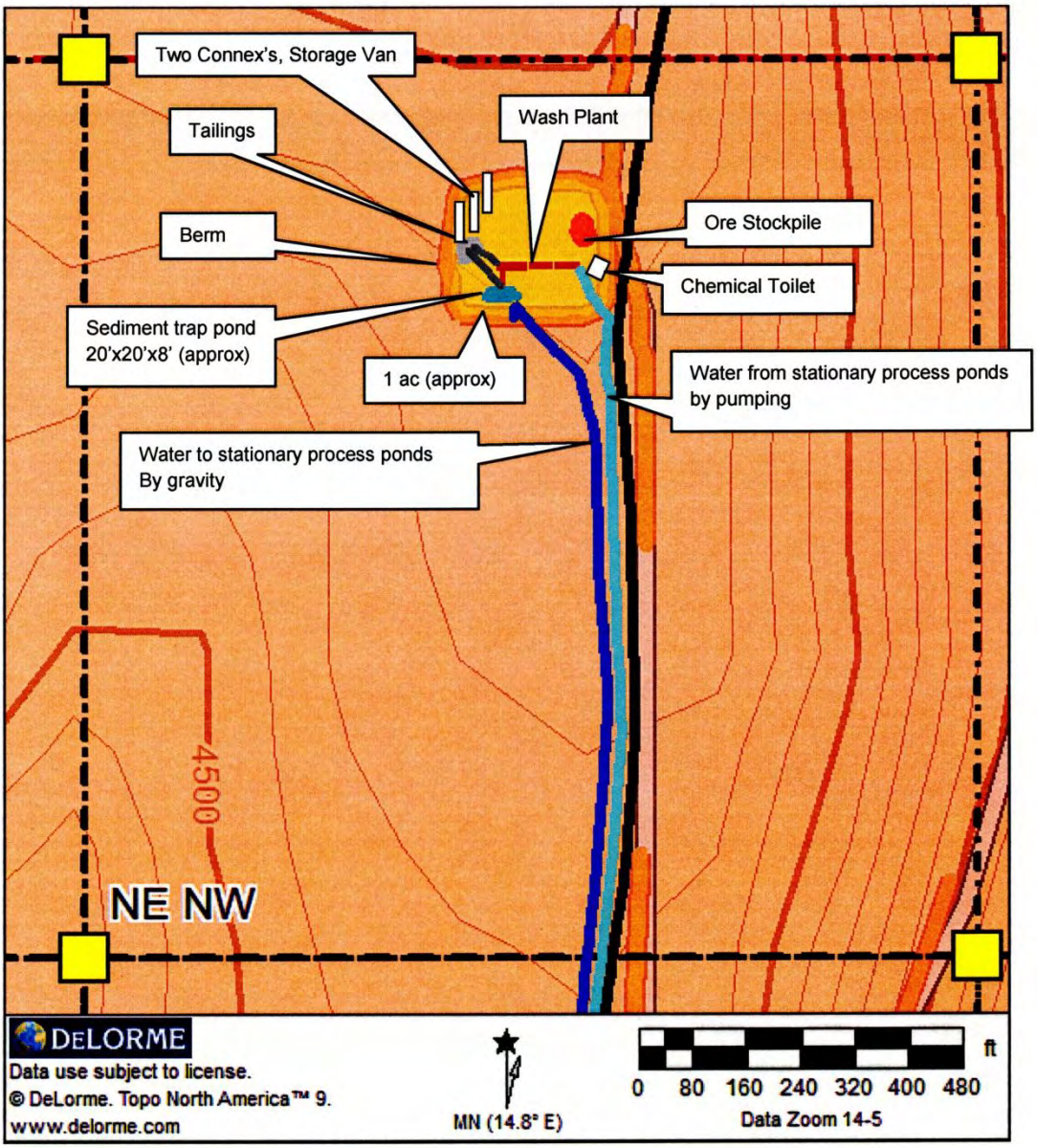
Rev
2

File: Pine Creek High Bar Mining Claims Map R9 042312 r1

Processing Detail Map – Site 1 (Mobile)

APPENDIX A

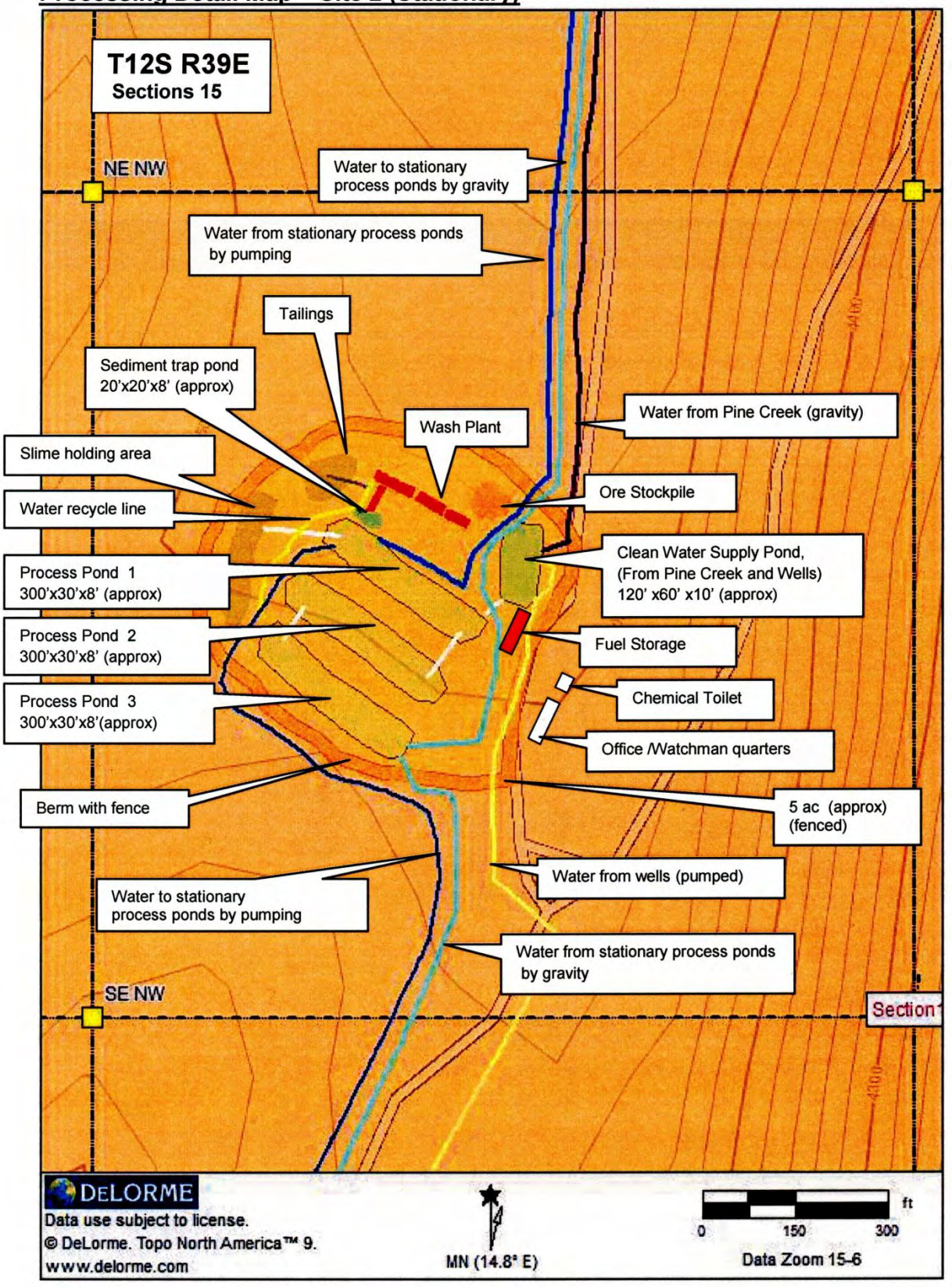
T12S R39E
Sections 15



Rev
1

File: Pine Creek High Bar Mining Claims Map R9 042312 r1

Processing Detail Map – Site 2 (Stationary)

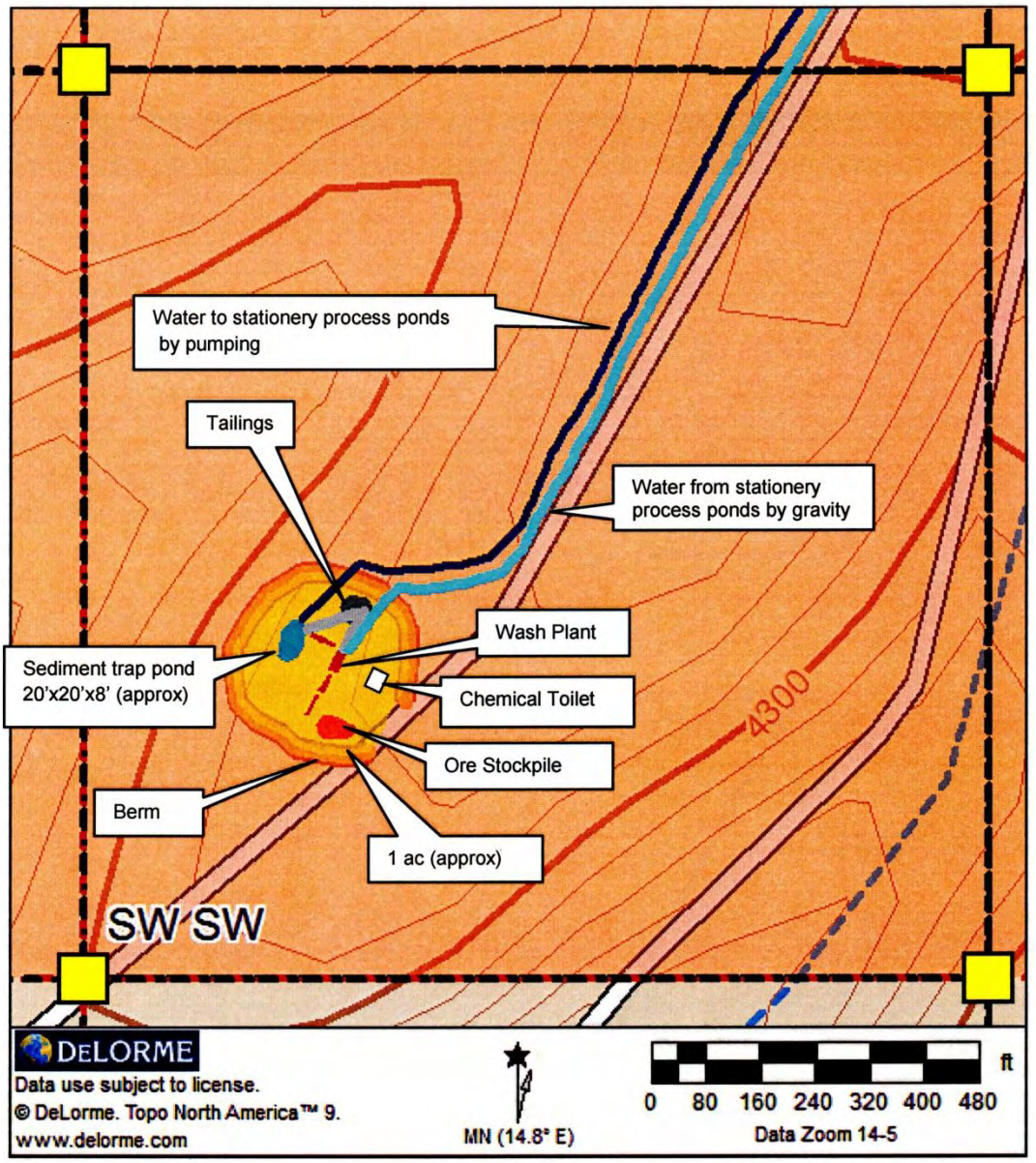


Rev 1

File: Pine Creek High Bar Mining Claims Map R9 042312 r1

Processing Detail Map – Site 3 (Mobile)

T12S R39E
Sections 15

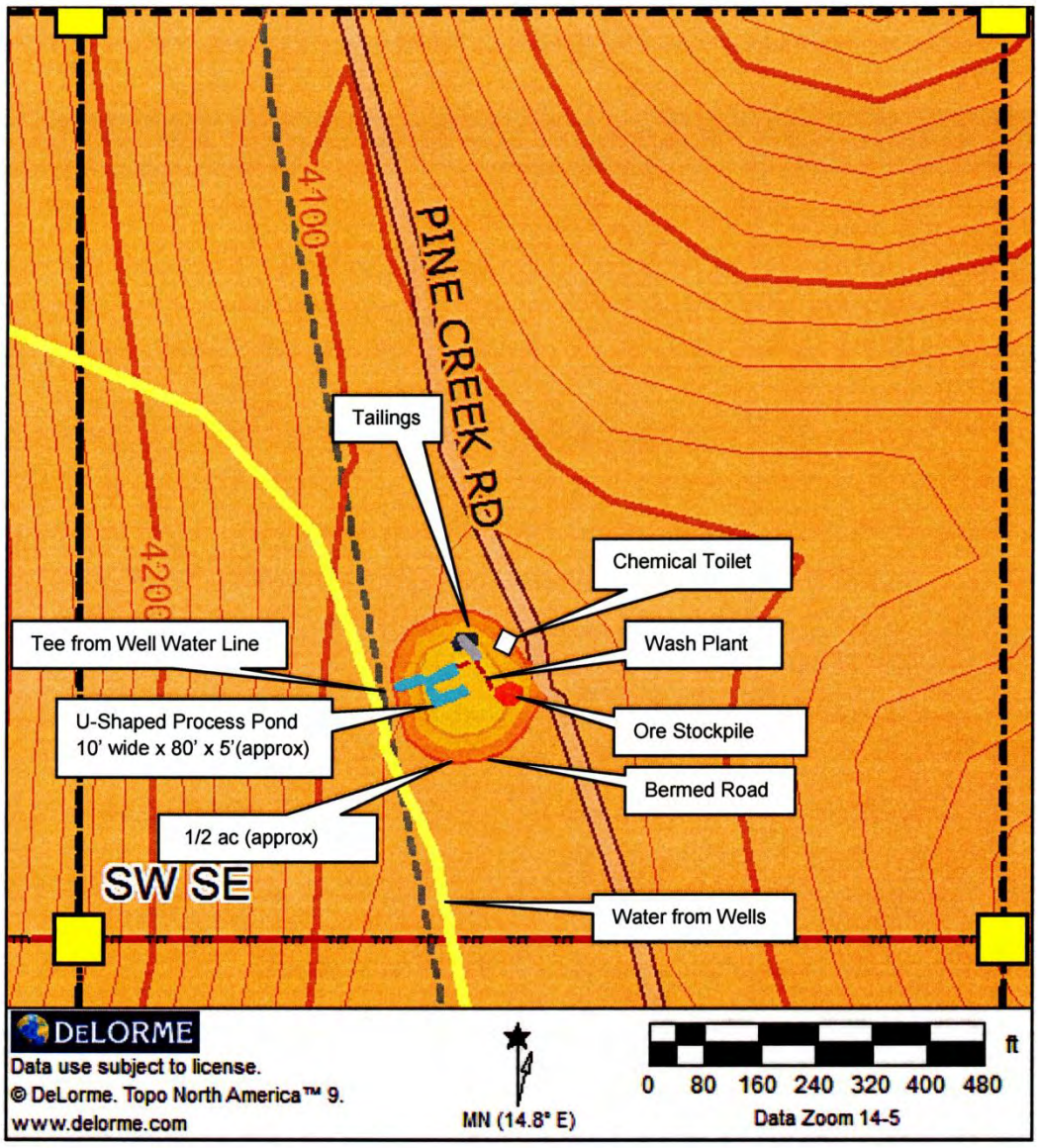


Rev
1

Processing Detail Map – Pack Rat Site –(Processing Site #4)

T12S R39E
Sections 15

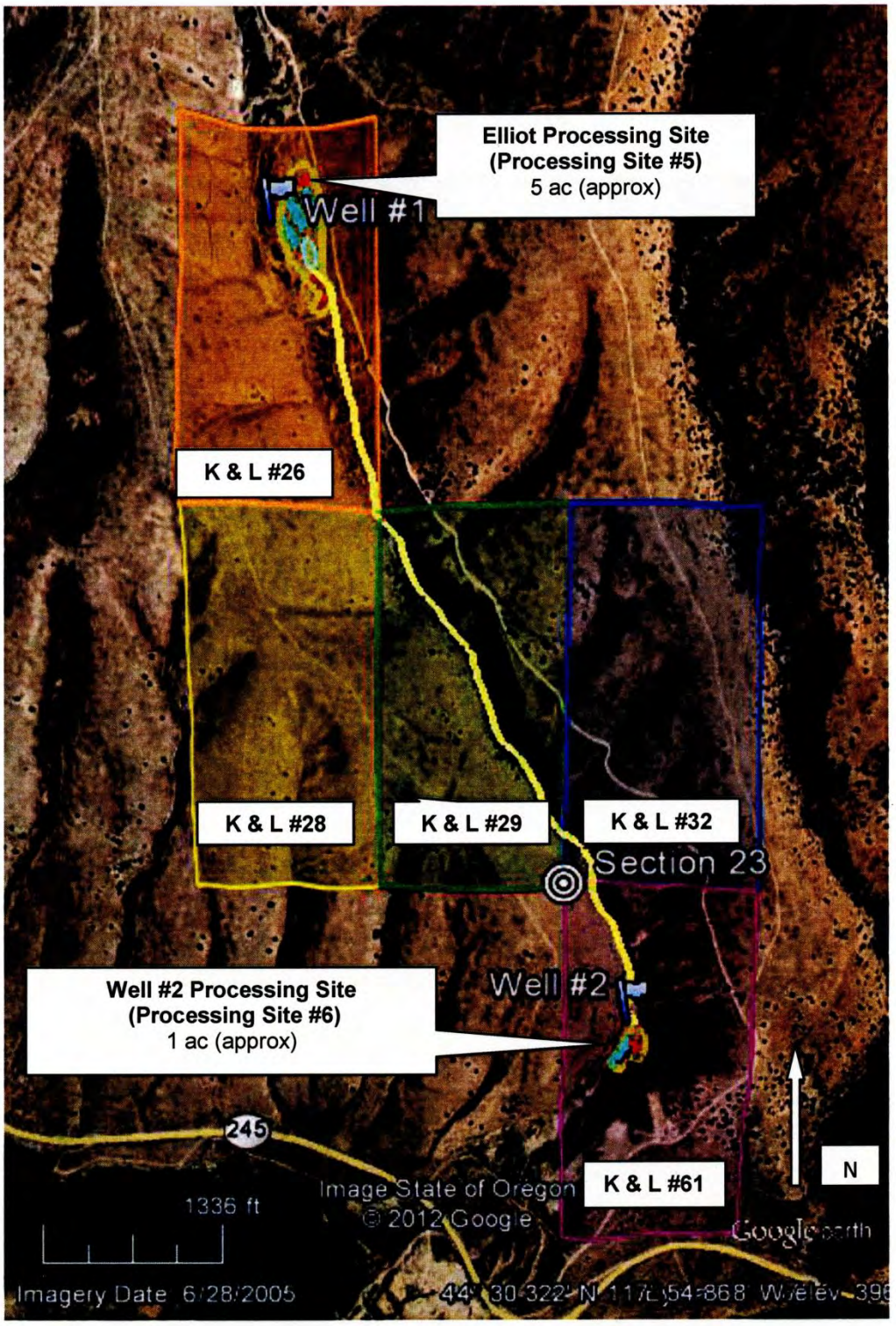
APPENDIX A



Rev
2

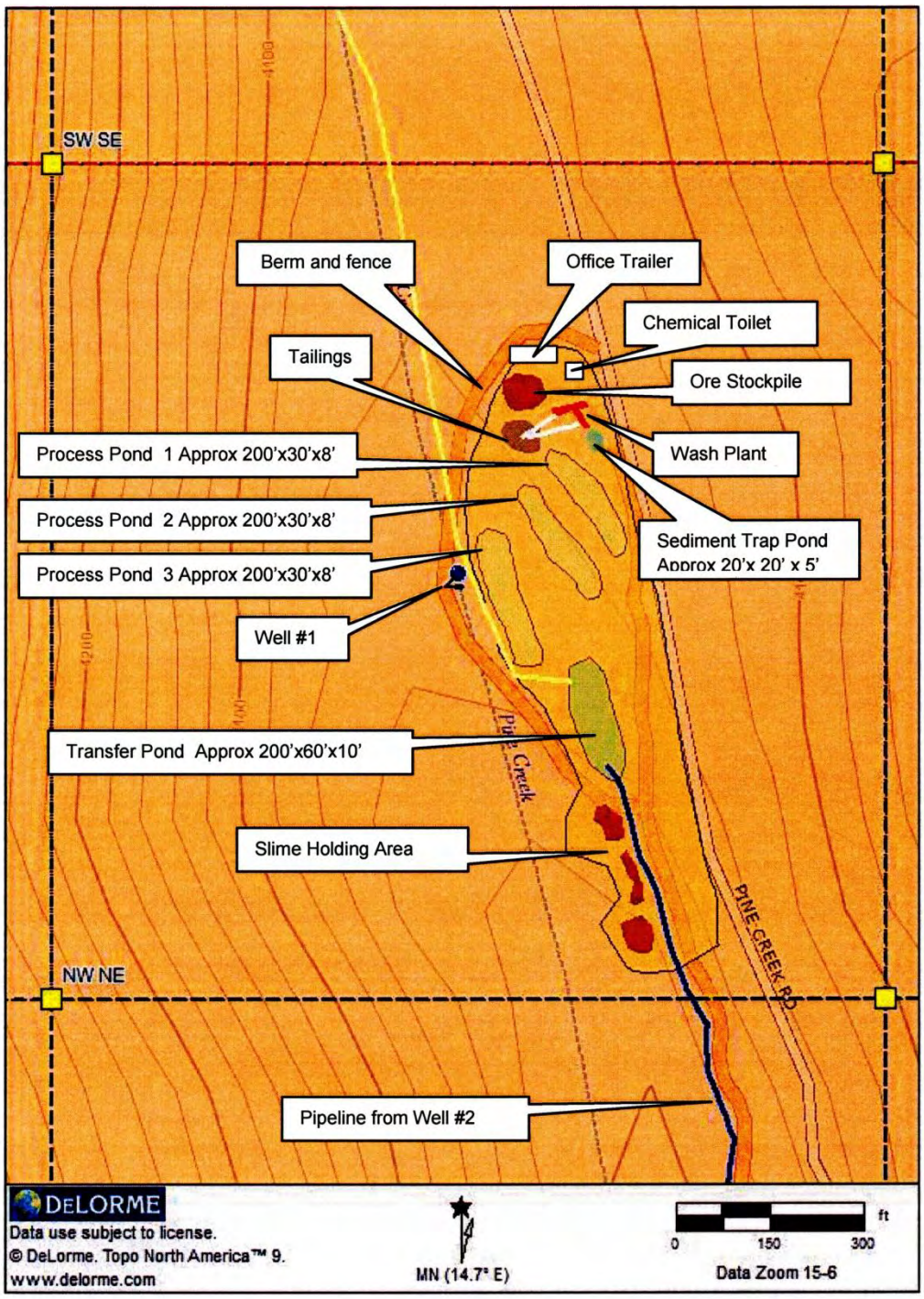
File: Pine Creek High Bar Mining Claims Map R9 042312 r1

Upper and Lower Pine Creek Project Area
T12S R39E –Section 22, 23, 26



Rev
1

Elliot Processing Site – (Processing Site #5)
T12S R39E –Section 22

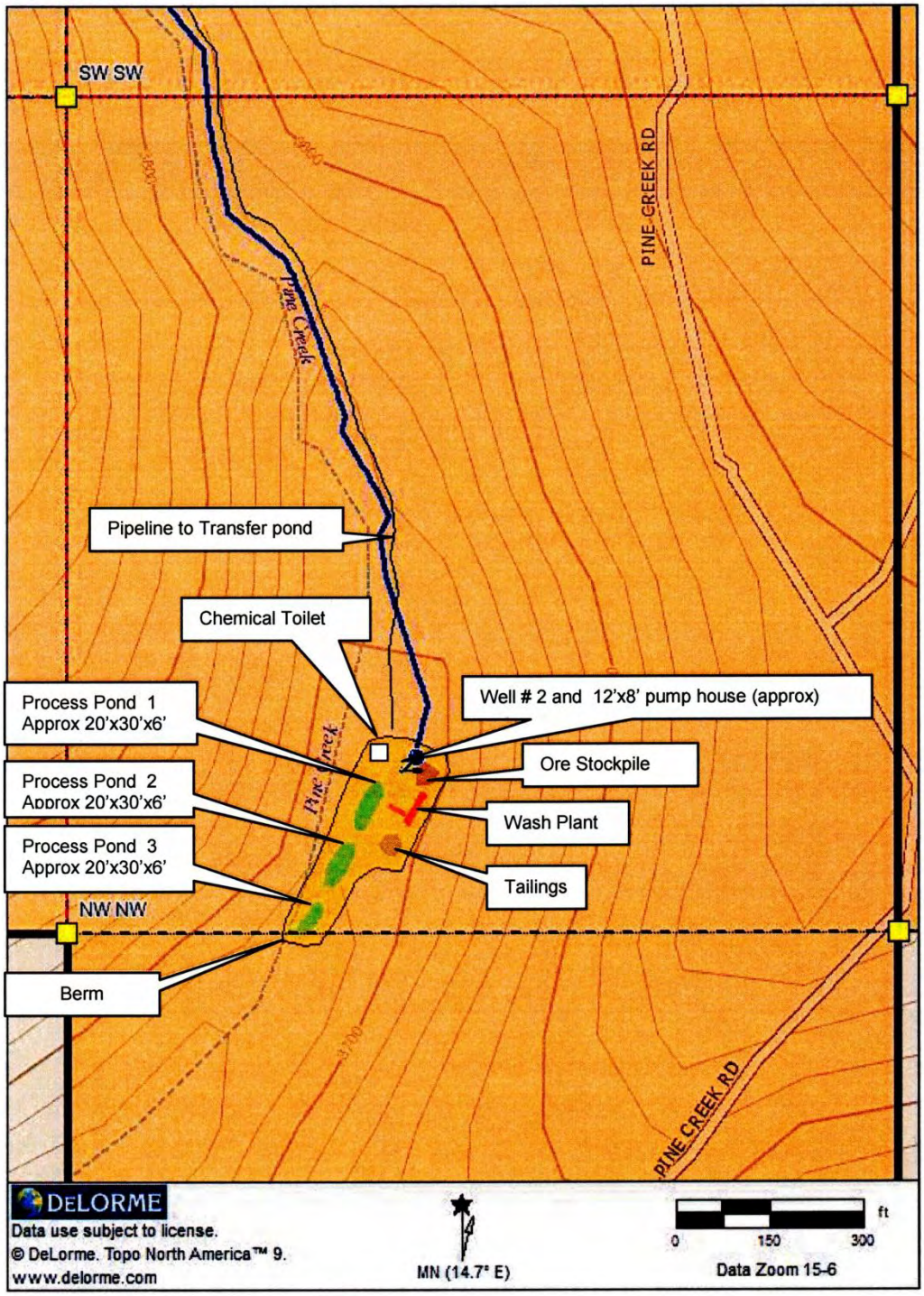


Rev
2

File: Pine Creek Upper And Lower Claims Maps R9 042212 r2 r2

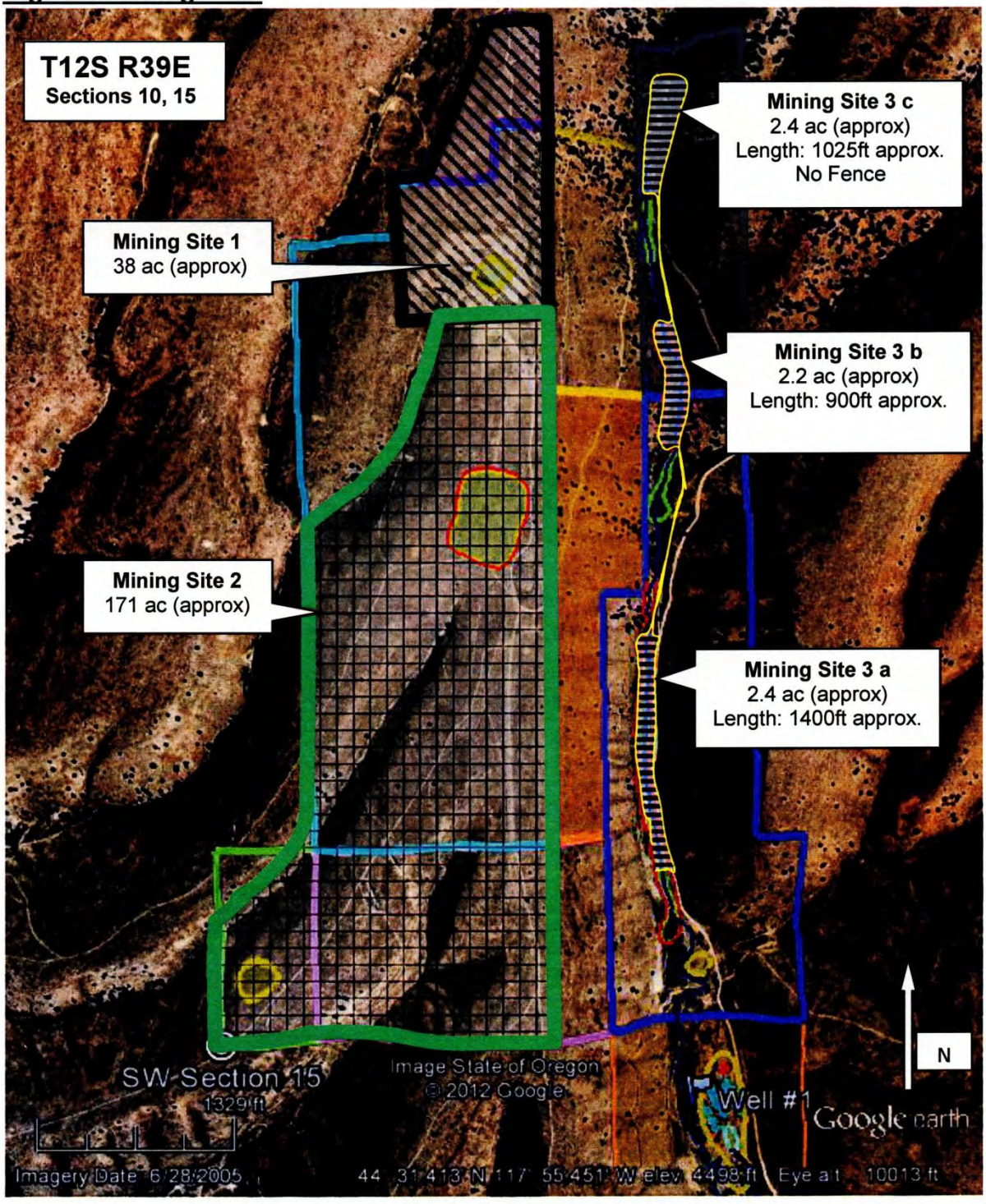
Well #2 Processing Site – (Processing Site #6)

T12S R39E –Section 26



Rev
2

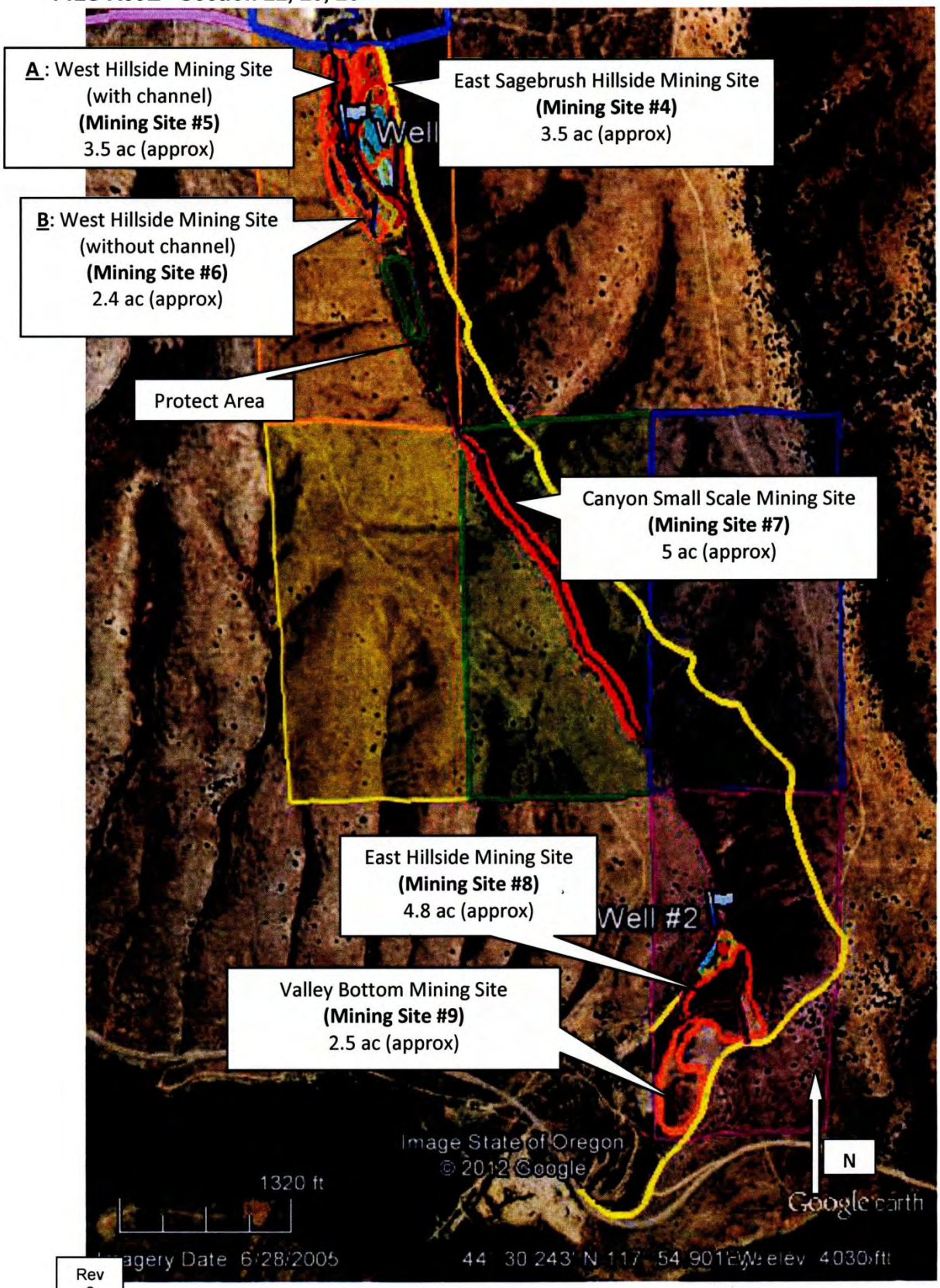
High Bar Mining Sites



Rev
1

File: Pine Creek High Bar Mining Claims Map R9 042312 r1

Upper and Lower Pine Creek Mining Sites
T12S R39E –Section 22, 23, 26

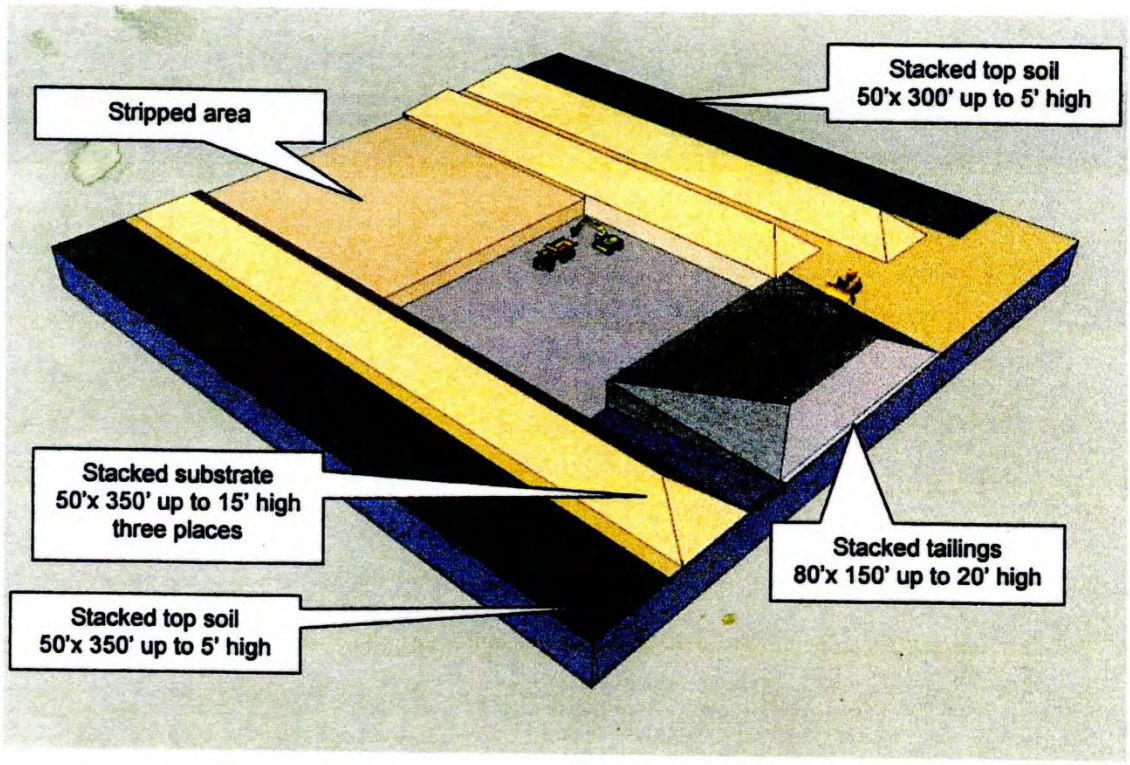


Rev 2

File: Pine Creek Upper And Lower Claims Maps R9 042212 r2 r2

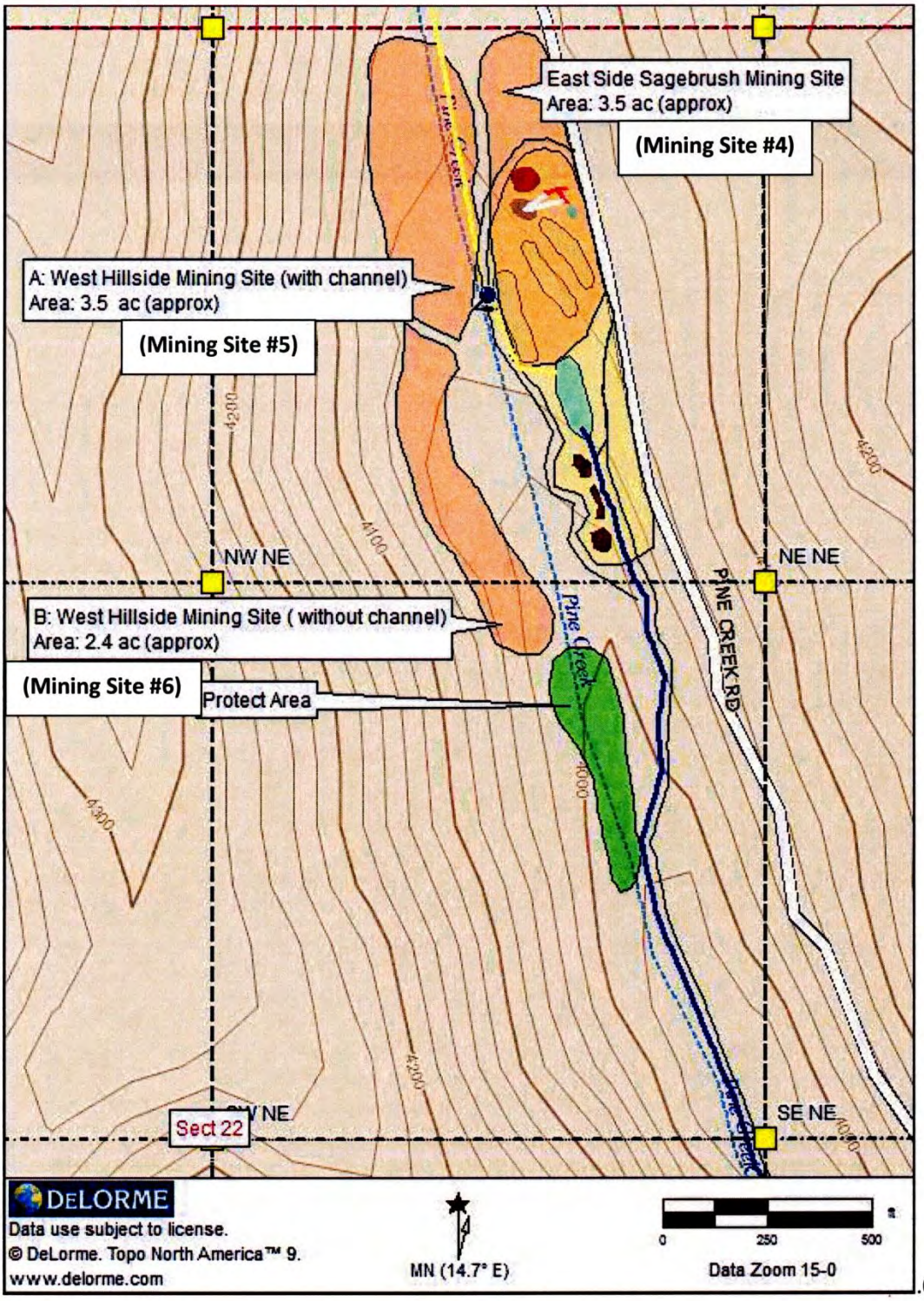
Typical High Bar Mining Site

(5 acre site)



Upper Pine Creek Mining Sites

T12S R39E –Section 22

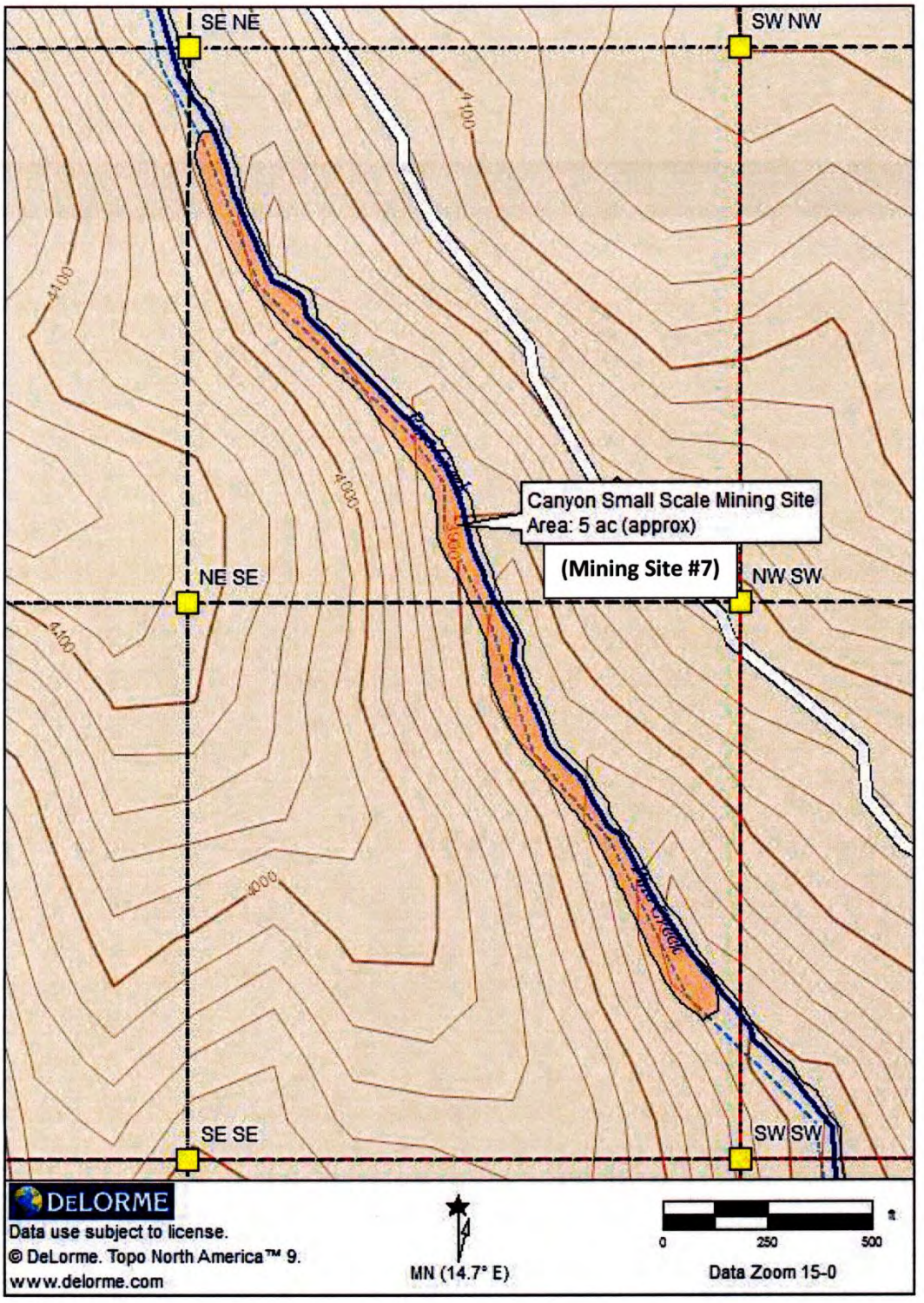


.02

Rev
1

File: Pine Creek Upper And Lower Claims Maps R9 042212 r2 r2

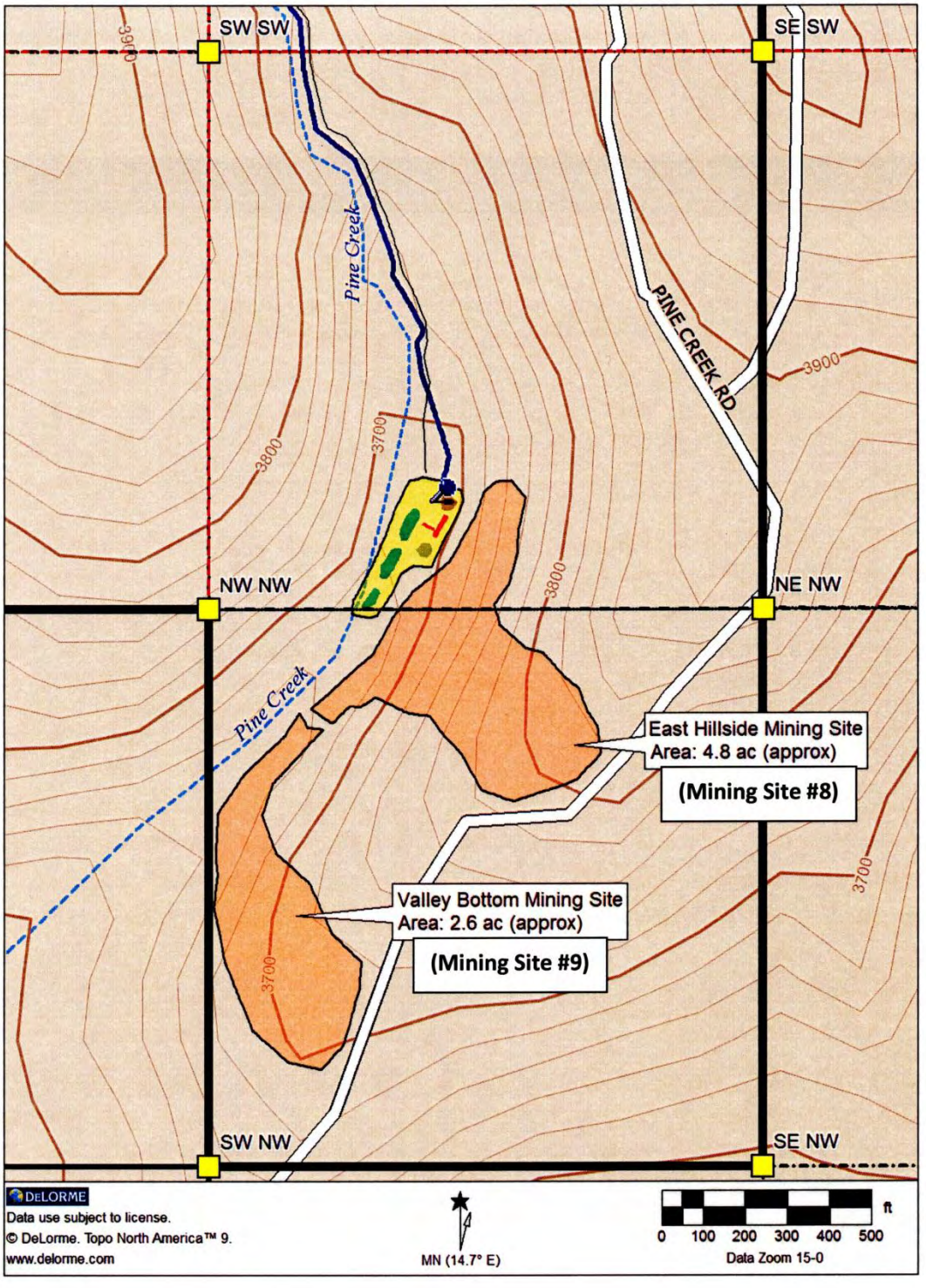
Lower Pine Creek Mining Site
T12S R39E –Section 22, 23



Rev
1

Lower Pine Creek Mining Sites

T12S R39E –Section 26



Rev
1

APPENDIX B

Spill Prevention, Containment and Countermeasures: High Bar Mining

Primary Contact: Philip Wirth, **High Bar Mining, LLC,** P.O. Box 428, Long Creek, OR 97856, 971-241-9202

Location of Facility: High Bar Mine, T12S R42E Sec 10, 15 W.M.

Access: From Hereford drive east to the junction of HWY 245 and Bald Mt. County Rd., turn north on the County Rd. The project area is on the west side of the road.

Material on Site:

Unleaded gasoline: 500 gallons or less stored in an above ground tank

LS Diesel: 10,000 gallons or less stored in an above ground tank.

MSDSs are available on site for all the above products. All tanks are labeled as is required by Federal and State law.

High Bar Mining's employees will be responsible for supervising initial containment action for releases and subsequent clean-up.

This plan identifies potential sources of spills, establishes measures of prevention, and defines control, cleanup and reporting procedures including instructions on what to do in the case of a spill.

Preparation of the SPCC plan is pursuant to 40CFR 112, Oil Pollutant Prevention, which "establishes procedures, methods, and equipment and other requirements for equipment to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable water of the United States or adjoining shorelines" (40CFRpart 112.3(e)).

Oil is considered the generic term for hydrocarbons and includes oil of any kind in any form, including, but not limited to petroleum, fuel, oil, sludge, oil refuse and oil mixed with water other than dredged soil (40CFR part 112.2).

A reportable spill includes but is not limited to, any spilling, leaking, pumping, pouring, emitting, or dumping, but excludes discharges in compliance with a permit under 402 of the Clean Water Act.

Prevention measures, containment and drainage control design, inspection procedures and disposal methods are defined in 40CFR 112, part 112.7. Prevention measures at the High Bar Mining Site include proper equipment and containment designs, periodic inspections, tank loading and unloading procedures and maintenance procedures.

Tanks in the fuel storage area are located within an earthen containment structure (berms). The fuel storage containment structure has a capacity of 11,110 gallons which is sufficient to contain the entire volume of both storage tanks plus ten percent. The fuel storage area is designed so that no spilled material can leave the facility. The fuel storage area is compacted earth over clay with loose gravel over the top.

Fuel vendor personnel will be required to remain with the transport vehicle and observe tank filling at all times, and remain attentive to tank level indicators to prevent tank overfills. Personnel engaged in fuel unloading and dispensing activities are required to remain with the vehicle until completion. Personnel are responsible for ensuring that these activities are conducted in a safe and environmentally sound manner. Minor spills that occur will be cleaned up with oil absorbent material. If a major spill occurs, a sump pump will be used to evacuate spilled material into a holding tank or back into secondary containment.

APPENDIX B

Tanks will be visually inspected weekly. Visual inspections are conducted with respect to the following:

1. Tank fill valves are to be in the closed position when not in use.

2. All valves will be inspected for signs of leakage or deterioration.

3. Inlet and outlet piping, as well as tank flanges are to be checked for leakage and to insure that adequate support is provided.

4. Level indicators and discharge control equipment will be checked to see that all are operating properly.

5. The tank shell surfaces are to be visually inspected for areas of rust or other signs of deterioration. Particular attention should be paid to areas with peeling paint (or other coating), welds, and seams.

6. The ground surface in the loading area is to be checked for obvious signs of leakage or spills, specifically stained or visibly damp areas.

Annual inspections will include inspection of the tank shell, welds, rivets and bolts, foundations, and supports. Aboveground valves and pipelines will be examined for the general conditions of flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports and condition of metal surfaces.

High Bar Mining's employees are trained in the elements of this SPCC plan to minimize the number of human errors that can cause spills.

Oil spill prevention measures are designed to minimize spills from occurring; however, occasional releases may occur. Small leaks and spills, confined to small areas, will be cleaned up as part of the ordinary operating procedure. In situations where a large leak occurs and remains confined to the secondary containment area, cleanup will proceed according to the direct countermeasures outlined below.

These countermeasures have been designed to mitigate the possibility of oil reaching a waterway. Employees will undertake these countermeasures immediately when there is any danger of oil entering any waterway and/or in the case of any large oil release.

In the case of a small spill, direct countermeasures include stopping the material release by plugging the leak source and/or closing the valve. Employees will make sure the spill is totally confined.

Should a spill of significant size occur, direct countermeasures include taking the necessary action to terminate the source of the flow of petroleum product. A trench will be dug or earthen berm constructed around the spill, whatever is necessary to contain the area of the spill or to stop it from entering a waterway or leaving the fuel storage area. Water will never be applied, instead appropriate oil absorbing material will be applied to prevent petroleum products from flowing into watercourses or off the site. Oil absorbent materials may include floor sweep, absorbent mats, socks, booms or any other appropriate cleanup materials. Any other actions, such as placing absorbent materials around the spill to minimize environmental damage will also be taken.

When direct countermeasures described above have been implemented, notification and reporting procedures will be followed. Cleanup must be initiated immediately following containment of the spill.

It is extremely important that any oil be prevented from reaching streams, drainages, ditches, property boundaries or any other place where water is or could potentially flow. Project personnel will exercise every available option to stop and confine the spill. Additionally, personnel are trained to anticipate and prevent water from flowing into a spill area. Water can be diverted around the spill area by constructing berms and/or ditches.

APPENDIX B

With the release of a small quantity spill, cleanup operations will be conducted by **High Bar Mining** employees. Should a significant spill occur, and if the owner is unable to complete clean-up of the spill, an outside contractor, who is bonded and licensed in hazardous materials clean-up, (such as Rich Environmental of Baker City) will be called to assist with the effort.

Spill containment and cleanup equipment available on site include the following:

Spill kit

Absorbent materials

The fuel storage containment structure has a capacity of 11,110 gallons which is sufficient to contain the entire volume of both storage tanks plus ten percent.

Loaders, cats and excavators, either on site or within ¼ mile

For spills on gravel or soil, it may be possible to absorb free liquid with absorbent materials prior to excavating and removing the contaminated material. Spills occurring on solid surfaces may be collected with the use of absorbent materials and then cleaned thoroughly with a non-hazardous solvent. Sufficient quantities of absorbent materials and other cleanup equipment will be maintained on site.

If small quantities of water exist with the spilled petroleum, the fluid may be absorbed in sawdust or sand and disposed of per DEQ regulations. The fluid may also be absorbed with the use of commercial products such as mats, socks or booms. If the spill is of significant size and/or duration, special cleanup efforts such as those provided by environmental contractors may be deemed necessary.

When cleaning up diesel or lubricating oil, all spent cleanup material such as rags, absorbents, etc., must be disposed of in accordance with approved procedures. Only approved locations or practices will be used to dispose of cleanup materials.

A reportable spill is defined as any noticeable amount of material released outside of containment. All spills over 42 gallons must be reported to DEQ and any quantity of spill in waters of the State is reportable. Records and reports of reportable spills shall be maintained for a period of five years by the owner, and will be made available for inspection upon request by EPA or State agency personnel.

Botanical Evaluation for Coswell Highbar Placer (Top)

Bureau of Land Management Vale District, Baker Resource Area

Botany Report Number: 2011-3 **Report Date:** June 30, 2011
Project Name: Casper
EA/Casefile No.: 63719

Location: T11S R39E Section 10 or N426397 E4930868

File Search/Previous Clearances:
No previous clearances documented; nearby historic records for special status species that would grow in this area under GeoBOB

Field Method/Survey Intensity:
Acres Inventoried: **Visibility:**
Field Survey Date: June, 28, 2011 **Field Examiner:** Yzquierdo

Soils: Clay

Plant Community Description: This area is located on the top section of BLM lands in Pine Creek. The community site was mixed mountain and Wyoming big sagebrush. The community sort h most part was in good condition and the drainage below the mining ponds looks to be an emerging riparian channel solely supported by seepage from ponds. There were a few areas that weedy (cheatgrass and fiddleneck), but in the communities that were not weedy Idaho fescue was the primary understory.

Special Status Plants Found During Inventory: None

Impacts of Proposed Action:
The proposed action is unlikely to have any effects on any special status plant species.

Recommendations (Including Mitigation):
Recommend authorization of project; however, not within the pools along the main channel.

Observations:
Vegetation species list

Upland
Oregon sunshine (*Eriophyllum lanatum*)
Silver-leaf phacelia (*Phacelia hastate)*
Buckwheat (*Eriogonum* sp. *)*
Bladderpod (*Lesquerella sp.)*
Alyssum (*Alyssum simplex)*
Parsley species (*Lomation* sp.)
Aster (*Aster* sp.)
Deathcamas (*Zigadenus* sp. *)*
Yarrow (*Achillea ageratifolia)*
Phlox (*Phlox sp.)*
Yampah (*Perideridia* sp.*)*
Phacelia (*Phacelia)*
Collomia (*Collomia grandiflora)*
Goosefoot violet (*Viola purpurea)*
Arrowleaf balsamroot (*Balsamorhiza sagittata)*
Wax current (*Ribes cereum)*
Prairie blazing star (*Lithophragma parviflora*)

Green rabbitbrush (*Ericameria teretifolia)*
Forget-me-not (*Myosotis arvensis)*
Indian paintbrush (*Castilleja* sp.)
Waterleaf (*Hydrophyllum sp.)*
False dandelion (*Nothocalais sp.)*
Sunflower (*Helianthus* sp.*)*
Silky lupine (*Lupinus sericeus)*
Milkvetch (*Astragalus* sp.)
Bitterroot (*Lewisia rediviva)*
Brodiaea (*Brodiaea* sp.*)*
Native thistle (Utah thistle) (*Cirsium utahense*)
Worm-leaf stonecrop (*Sedum stenopetalum ssp. Stenopetalum*)
Alumroot (*Heuchera* sp.*)*
Prince plume (*Stanleya pinnata*)
Prickly sandwart (*Arenaria aculeata*)
Wild onion (*Allium ascalonicum)*
Larkspur (*Delphinium* sp.*)*
Curlycup gumweed (*Grindelia squarrosa)*
Gray rabbitbrush (*Ericameria nauseosa*)
Basin big sagebrush (*Artemisia tridentata* Nutt. ssp. *Tridentate)*
Wyoming big sagebrush (*Artemisia tridentata* Nutt. ssp. *Wyomingensis)*
Mountain big sagebrush (*Artemisia tridentata* Nutt. ssp. *Vaseyana)*
Oregon grape (*Mahonia aquifolium*)
Sandwort (*Arenaria* sp.*)*
Shaggy Fleabane (*Erigeron pumilus)*
Alfalfa (*Cuscuta approximate)*
Spiny hopsage (*Grayia spinosa)*
Pussytoes *(Antennaria anaphaloides)*
Flax *(Linum narbonense)*
Showy penstemon (*Penstemon spectabilis)*
Blue penstemon (*Penstemon cyaneus)*
Lowly penstemon (*Penstemon humilis)*
Wilcox's penstemon (*Penstemon wilcoxii)*
Wolly-pod locoweed (*Astraguls purshii)*
Thread-stalk locoweed (*Astragalus filipes*)

Grass
Idaho fescue (*Festuca idahoensis)*
Bluebunch wheatgrass (*Pseudoroegneria spicata)*
Squirreltail bottlebrush (*Elymus elymoides*)
Smooth brome (*Bromus inermis)*
Bulbous bluegrass (*Poa bulbosa)*
Cheatgrass (*Bromus tectorum)*
Basin wildrye (*Leymus cinereus)*
Timothy (*Phleum* sp.*)*
Mannagrass (*Glyceria*)
Prairie junegrass (*Koeleria macrantha)*
Sandberg bluegrass *(Poa secunda*)
Onespike danthonia (*Danthonia unispicata*)

Trees
Ponderosa Pine (*Pinus ponderosa)*
Coyote Willow (*Salix exigua)*
Western juniper (*Juniperus occidentalis)*
Whiplash willow (*Salix Lasiandra)*

Weeds
Bull thistle (*Cirsium vulgare)*
Sulfur cinquefoil (*Potentilla gracilis*)
Hounds tongue (*Hieracium cynoglossoides)*
Catchweed bedstraw (*Galium album)*
Canada thistle (*Cirsium arvense)*
Scotch thistle (*Onopordum acanthium)*
Prickly lettuce (*Lactuca serriola)*
Tumble mustard (*Thelypodiopsis* sp.)
Mullen (*Verbascum thapsus*)
Teasel (*Dipsacus* sp.)
Clasping pepperweed (*Lepidium* sp.)
Fiddleneck (*Amsinckia* sp.*)*
Shepard's purse (*Capsella bursa-pastoris)*
Whitetop (*Cardaria draba)*
Bur Buttercup (*Ranunculus)*

Riparian/facultative
Miner's lettuce (*Montia* sp.*)*
Columbine (*Aquilegia canadensis)*
Strawberry (*ragaria* sp.*)*
Herb sage (*Salvia apiana)*
Stinging nettle (*Hesperocnide* sp.)
Nettleleaf Horsemint (*Agastache urticifoli))*
Nightshade (*Circaea* sp.*)*
Clematis (*Clematis ligusticifolia)*
Golden currant (*Ribes aureum)*
Kentucky bluegrass (*Poa pratensis)*
Watercress (*Nasturtium officinale)*
Large-headed clover (*Trifolium macrocephalum)*
Sweet clover (*Melilotus* sp.*)*
Veronica (*Brickellia veronicifolia)*
Rocky Mountain iris (*Iris missouriensis*)
Curly dock (*Rumex crispus)*
Dandelion (*Taraxacum* sp.*)*
Showy milkweed (*Asclepias speciosa)*
Wild geranium (*Geranium viscosissimum)*
Spike Rush (*Eleocharis* sp.)
Common Plantain (*Plantago major)*
Nebraska Sedge (*Carex nebrascensis)*
Baltic Rush (*Juncus balticus*)
Nevada Rush (*Juncus tiehmii*)
Black Medic (*Medicago lupulina)*

Signature: Melissa Uzquierdo

Botanical Evaluation for Casper

Bureau of Land Management Vale District, Baker Resource Area

Botany Report Number: 2011-1 **Report Date:** June 27, 2011
Project Name: Casper
EA/Casefile No.: 60224

Location: Down the Pine Creek Drainage in Brannon Gulch

File Search/Previous Clearances:
No previous clearances documented; nearby historic records for special status species that would grow in this area under GeoBOB

Field Method/Survey Intensity:
Acres Inventoried: **Visibility:**
Field Survey Date: June, 22, 2011 **Field Examiner:** Yzquierdo/Bryant

Soils: Clay

Plant Community Description: Open drainage with willows and Great Basin sagebrush

Special Status Plants Found During Inventory: None

Impacts of Proposed Action:
The proposed action is unlikely to have any effects on any special status plant species.

Recommendations (Including Mitigation):
Recommend authorization of project; however, not within the pools along the main channel.

Observations:
This site is comprised of a channel riparian area that had both riparian and upland species. This looks like it was mined back in the early 1900's with much of the vegetation coming back. There was a series of heatcuts and this area had hounds tongue pretty consistent throughout the whole drainage. This are also had a series of settling ponds that had Columbia spotted frogs (please see wildlife write-up for information). The community looked like it was in rather good condition in spite of all the weedy species within the channel.

Vegetation species list

Upland
Oregon sunshine (*Eriophyllum lanatum*)
Silver-leaf phacelia (*Phacelia hastate)*
Buckwheat (*Eriogonum* sp. *)*
Bladderpod (*Lesquerella sp.)*
Alyssum (*Alyssum simplex)*
Parsley species (*Lomation* sp.)
Aster (*Aster* sp.)
Deathcamas (*Zigadenus* sp. *)*
Yarrow (*Achillea ageratifolia)*
Phlox (*Phlox sp.)*
Yampah (*Perideridia* sp.*)*
Phacelia (*Phacelia)*
Collomia (*Collomia grandiflora)*
Goosefoot violet (*Viola purpurea)*
Arrowleaf balsamroot (*Balsamorhiza sagittata)*
Wax current (*Ribes cereum)*
Prairie blazing star (*Lithophragma parviflora*)
Green rabbitbrush (*Ericameria teretifolia)*
Forget-me-not (*Myosotis arvensis)*
Indian paintbrush (*Castilleja* sp.)
Waterleaf (*Hydrophyllum sp.)*
False dandelion (*Nothocalais sp.)*
Sunflower (*Helianthus* sp.*)*
Silky lupine (*Lupinus sericeus)*
Milkvetch (*Astragalus* sp.)
Bitterroot (*Lewisia rediviva)*
Brodiaea (*Brodiaea* sp.*)*
Native thistle (Utah thistle) (*Cirsium utahense*)
Worm-leaf stonecrop (*Sedum stenopetalum ssp. Stenopetalum*)
Alumroot (*Heuchera* sp.*)*
Prince plume (*Stanleya pinnata*)
Prickly sandwart (*Arenaria aculeata*)
Wild onion (*Allium ascalonicum)*
Larkspur (*Delphinium* sp.*)*
Curlycup gumweed (*Grindelia squarrosa)*
Gray rabbitbrush (*Ericameria nauseosa*)
Basin big sagebrush (*Artemisia tridentata* Nutt. ssp. *Tridentate)*
Wyoming big sagebrush (*Artemisia tridentata* Nutt. ssp. *Wyomingensis)*
Mountain big sagebrush (*Artemisia tridentata* Nutt. ssp. *Vaseyana)*
Oregon grape (*Mahonia aquifolium*)
Sandwort (*Arenaria* sp.*)*
Shaggy Fleabane (*Erigeron pumilus)*
Alfalfa (*Cuscuta approximate)*
Spiny hopsage (*Grayia spinosa)*

Grass
Idaho fescue (*Festuca idahoensis)*
Bluebunch wheatgrass (*Pseudoroegneria spicata)*
Squirreltail bottlebrush (*Elymus elymoides*)
Smooth brome (*Bromus inermis)*
Bulbous bluegrass (*Poa bulbosa)*
Cheatgrass (*Bromus tectorum)*
Basin wildrye (*Leymus cinereus)*
Timothy (*Phleum* sp.*)*
Mannagrass (*Glyceria*)

Trees
Black cottonwood (*Populus balsamifera)*
Ponderosa Pine (*Pinus ponderosa)*
Peach leaf willow (*Salix amygdaloides)*
Coyote Willow (*Salix exigua)*
Booths Willow (*Salix boothii)*
Quaking aspen (*Populus tremuloides)*
Redosier dogwood (*Cornus sericea)*
Western juniper (*Juniperus occidentalis)*
Choke cherry (*Prunus virginiana)*

Weeds
Bull thistle (*Cirsium vulgare)*
Sulfur cinquefoil (*Potentilla gracilis*)
Hounds tongue (*Hieracium cynoglossoides)*
Catchweed bedstraw (*Galium album)*
Canada thistle (*Cirsium arvense)*
Scotch thistle (*Onopordum acanthium)*
Prickly lettuce (*Lactuca serriola)*
Tumble mustard (*Thelypodiopsis* sp.)
Mullen (*Verbascum thapsus*)
Teasel (*Dipsacus* sp.)
Clasping pepperweed (*Lepidium* sp.)
Fiddleneck (*Amsinckia* sp.*)*
Shepard's purse
Whitetop (*Cardaria draba)*
Bur Buttercup (*Ranunculus)*

Riparian/facultative
Miner's lettuce (*Montia* sp.*)*
Columbine (*Aquilegia canadensis)*
Strawberry (*ragaria* sp.*)*
Herb sage (*Salvia apiana)*
Wood's Rose (*Rosa woodsii)*
Stinging nettle (*Hesperocnide* sp.)
Nettleleaf Horsemint (*Agastache urticifoli))*
Nightshade (*Circaea* sp.*)*
Clematis (*Clematis ligusticifolia)*
Golden currant (*Ribes aureum)*
Kentucky bluegrass (*Poa pratensis)*
Watercress (*Nasturtium officinale)*
Large-headed clover (*Trifolium macrocephalum)*
Sweet clover (*Melilotus* sp.*)*
Veronica (*Brickellia veronicifolia)*
Rocky Mountain iris (*Iris missouriensis*)
Curly dock (*Rumex crispus)*
Dandelion (*Taraxacum* sp.*)*

Showy milkweed (*Asclepias speciosa)*
Wild geranium (*Geranium viscosissimum)*
Spike Rush (*Eleocharis* sp.)
Common Plantain (*Plantago major)*
Nebraska Sedge (*Carex nebrascensis)*
Baltic Rush (*Juncus balticus*)
Nevada Rush (*Juncus tiehmii*)
Black Medic (*Medicago lupulina)*

Signature: Melissa Fagnierdu

Wildlife Evaluation for Casper

Bureau of Land Management Vale District, Baker Resource Area

Wildlife Report Number: 2011-2
Project Name: Casper Mining Claim
EA/Casefile No.: 60224

Report Date: 6/22/11

Location: Brannon Gulch T11S R39E Sec 10

Wildlife Observed:
Mule deer
Western meadowlark
Red-wing blackbird
Garter snake
Columbia spotted frog
Mallard duck
Killdeer
Cottontail rabbit
Back-tailed jackrabbit
Rattlesnake
Cedar waxwing
Warbler
Sage sparrow
Redtail hawk
Northern harrier
Pacific tree frog
Bull snake
Horned lark
Chukar
Loggerhead shrike
Raven
Turkey vulture
Common nighthawk
Pocket gopher
Vole
Cicada/dragonfly/damselfly
Belding's ground squirrel
Yellow swallowtail
American robin
European starling
Blackbirds
Field mouse
Cliff swallow
King fisher

Other Presence:
Elk scat
Coyote scat
Badger burrows
Marmot

Special Status or General Wildlife likely to be in area; habitat; survey considerations:
At the time of the survey, there was no special status wildlife species present within the project area. Potential habitat that would support big and upland game is limited. This area is not classified as critical wintering range for big game because it is located in an area that would receive high snow-loads and sagebrush canopy densities would not contribute to thermal and hiding cover.

Potential for occurrence or habitat for:
According to the best available records and field observations, no established federal or state listed species currently occur within the analysis area. However, there is a seasonal habitat for sage-grouse. No eagle (bald/golden) activity was identified.

Found no indications or presence of:
Bald and golden eagles, sage-grouse

File Search/Previous Clearances:
A botanical survey was conducted at the same time

Field Method/Survey Intensity:
Acres Inventoried: 200 **Visibility:** Clear
Field Survey Date: 6/22/11 **Field Examiner:** Melissa Yzquierdo/Emily Bryant

Impacts of Proposed Action:
The proposed action is unlikely to have any effects on any special status or general wildlife species. During the project wildlife would disperse of the project site, but later would start to use the area after reclamation. Because this area is not a critical foraging site, wildlife could find areas to feed adjacent to the project area.

Recommendations (Including Mitigation):
Recommend authorization of project. Mitigation necessary for spotted frogs within ponds seasonal restrictions on sage-grouse.

Signature: Melissa Yzquierdo

Wildlife Evaluation for Coswell Highbar Placer Mining Claim

Bureau of Land Management Vale District, Baker Resource Area

Wildlife Report Number: 2011-4
Project Name: Casper Mining Claim
EA/Casefile No.: 60224

Report Date: 6/30/11

Location: N426397 E4930868

Wildlife Observed:
Mule deer
Western meadowlark
Red-wing blackbird
Killdeer
Cottontail rabbit
Back-tailed jackrabbit
Cedar waxwing
Sage sparrow
Redtail hawk
Northern harrier
Bull snake
Horned lark
Chukar
Loggerhead shrike
Raven
Turkey vulture
Common nighthawk
Pocket gopher
Vole
Cicada/dragonfly/damselfly
Belding's ground squirrel
Yellow swallowtail
American robin
European starling
Blackbirds
Field mouse
Roughleg hawk
Ferruginous hawk

Other Presence:
Elk scat
Coyote scat
Badger burrows
Marmot

Special Status or General Wildlife likely to be in area; habitat; survey considerations:
At the time of the survey, there was no special status wildlife species present within the project area. The area surveyed was located with the riparian area that would support various wildlife species.

Potential for occurrence or habitat for:
According to the best available records and field observations, no established federal or state listed species currently occur within the analysis area. However, there is habitat for sage-grouse.

Found no indications or presence of:
Sage-grouse/ Columbia spotted frog/Bald or golden eagles

File Search/Previous Clearances:
A botanical survey was conducted at the same time.

Field Method/Survey Intensity:
Acres Inventoried: 300 **Visibility:** Clear
Field Survey Date: 6/27/11 **Field Examiner:** Melissa Yzquierdo

Impacts of Proposed Action:
The proposed action is going to have minor to moderate effects on general wildlife species. However, most likely wildlife species would be displaced and return to the area after cessation of mining activity. During the project wildlife would disperse of the project site, but later would start to use the area after reclamation. Because this area is not a critical foraging site, wildlife could find areas to feed adjacent to the project area.

Recommendations (Including Mitigation):
Recommend authorization of project with BMPs specifically for sage-grouse. If mining within the channel then BMPs will be included.

Recommended BMPs

Signature: Melissa Yzquierdo

Wildlife Evaluation for Coswell Mining Claim

Bureau of Land Management Vale District, Baker Resource Area

Wildlife Report Number: 2011-3
Project Name: Casper Mining Claim
EA/Casefile No.: 60224

Report Date: 6/30/11

Location: Brannon Gulch T11S R39E Sec 10-15

Wildlife Observed:
Mule deer
Western meadowlark
Red-wing blackbird
Garter snake
Columbia spotted frog
Mallard duck
Killdeer
Cottontail rabbit
Back-tailed jackrabbit
Rattlesnake
Cedar waxwing
Warbler
Sage sparrow
Redtail hawk
Northern harrier
Pacific tree frog
Bull snake
Horned lark
Chukar
Loggerhead shrike
Raven
Turkey vulture
Common nighthawk
Pocket gopher
Vole
Cicada/dragonfly/damselfly
Belding's ground squirrel
Yellow swallowtail
American robin
European starling
Blackbirds
Field mouse
Cliff swallow
King fisher

Other Presence:
Elk scat
Coyote scat
Badger burrows
Marmot

Special Status or General Wildlife likely to be in area; habitat; survey considerations:
At the time of the survey, there was no special status wildlife species present within the project area. The area surveyed was located with the riparian area that would support various wildlife species.

Potential for occurrence or habitat for:
According to the best available records and field observations, no established federal or state listed species currently occur within the analysis area. However, there is a seasonal habitat for sage-grouse. There was a presence of Columbia spotted frog and mitigation is recommended.

Found no indications or presence of:
Sage-grouse, bald and golden eagles

File Search/Previous Clearances:
A botanical survey was conducted at the same time

Field Method/Survey Intensity:
Acres Inventoried: 200 **Visibility:** Clear
Field Survey Date: 6/22/11 **Field Examiner:** Melissa Yzquierdo/Emily Bryant

Impacts of Proposed Action:
The proposed action is going to have minor to moderate effects on general wildlife species. However, most likely wildlife species would be displaced and return to the area after cessation of mining activity. During the project wildlife would disperse of the project site, but later would start to use the area after reclamation. Because this area is not a critical foraging site, wildlife could find areas to feed adjacent to the project area.

Recommendations (Including Mitigation):
Recommend authorization of project. Mitigation necessary for spotted frogs within ponds and seasonal restrictions BMPs for sage-grouse.

Signature: Melissa Yzquierdo

High Bar Ridge Top (OR-63719 sites 1 and 2)

Map Unit	Soil Series	Soil Survey slope %	Dominant slope percent calculation inside study area/map unit	Slope classification	Acres	Highly Erodible Land (HEL)	Drainage	HG	Sand % surface horizon	Silt % surface horizon	Clay % surface horizon
33C	Burntriver gravelly silt loam	2-12	>15-30	Strong slopes	132.9	No	Well drained	B	26.5	53.5	20
34D	Campcreek -Skullgulch association	12-35	>60	Extreme to very steep slopes	52.55	Yes	Well drained	C	39.2	37.3	23.5
34E	Campcreek -Skullgulch association	35-60	>60	Extreme to very steep slopes	18.81	Yes	Well drained	C	39.2	37.3	23.5
80E	Hyall-Simas association	35-60	>60	Extreme to very steep slopes	0.94	No	Well drained	C	33.3	31.7	35

*HG=Hydrologic Group

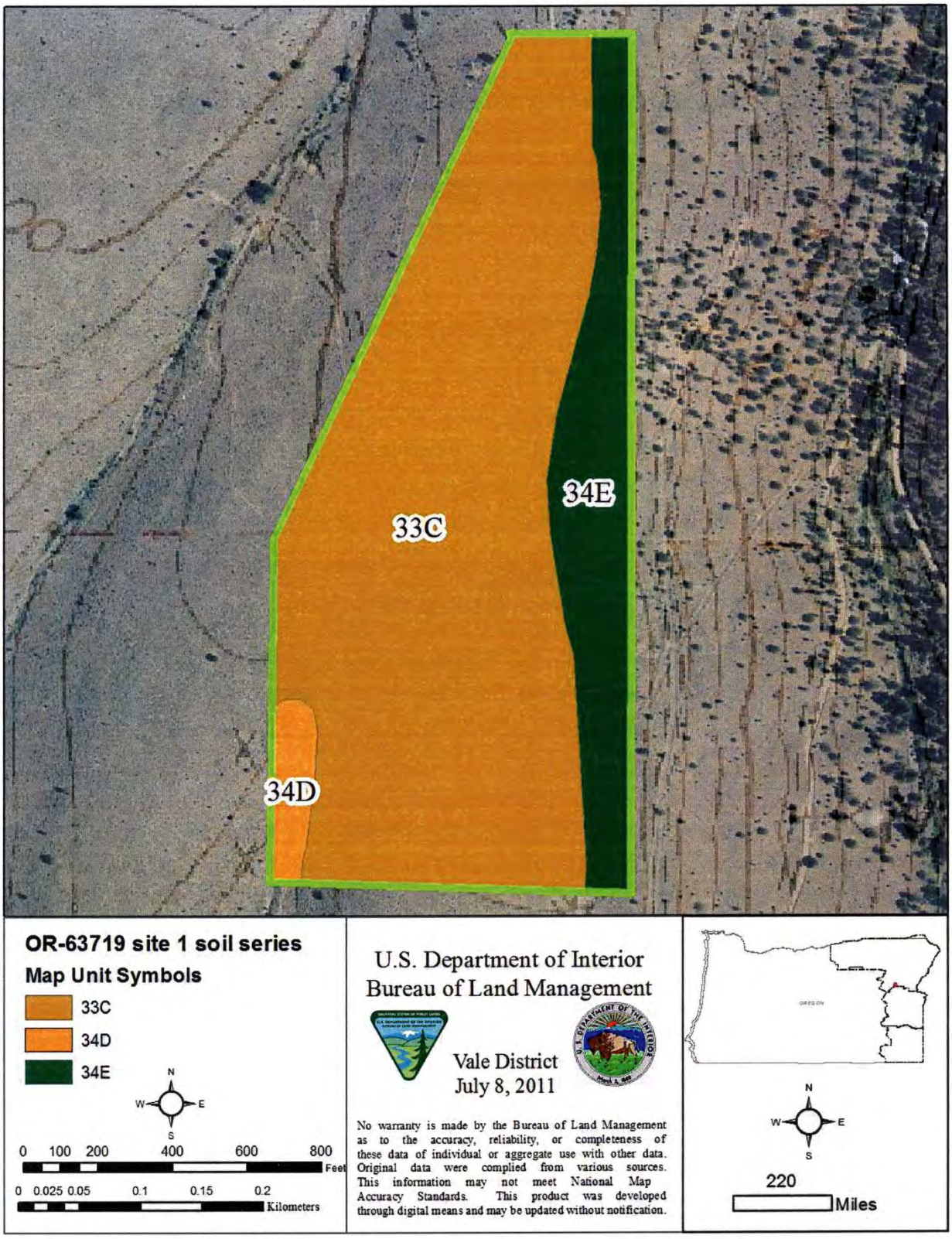


Figure 1. OR-63719 site 1 project area soil series

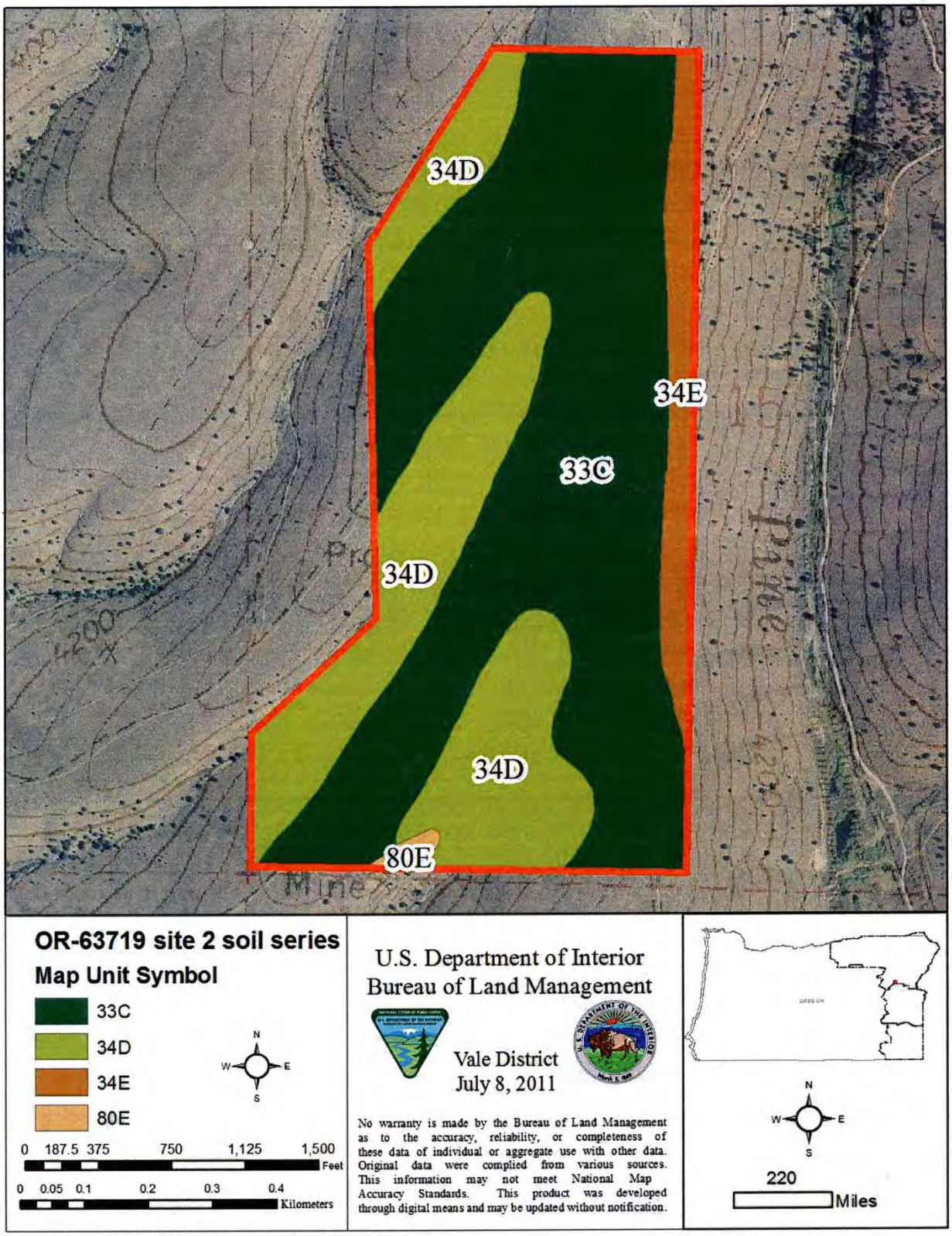


Figure 2. OR-63719 site 2 project area soil series

Pine Creek Valley Bottom (OR-63719 site 3)

Map Unit	Soil series	Soil Survey slope %	Dominant slope percent calculation inside study area/map unit	Slope classification	Acres	Highly Erodible Land (HEL)	Drainage	HG	Sand % surface horizon	Silt % surface horizon	Clay % surface horizon
104D	Marack silt loam	12-35	0-15	Level to moderate slopes	0.06	Yes	Well drained	C	30.1	54.9	15
106D	Marack very gravelly silt clay loam	12-35	>60	Extreme to very steep slopes	10.95	Yes	Well drained	C	20	49	31
147E	Segundo very gravelly loam	35-50	>45-60	Extreme slopes	0.00001	Yes	Well drained	B	35	50	15
168C	Typic Xerorthents cobbly	2-12	0-15	Level to moderate slopes	4.76	No	Moderately well drained	A	81.1	16.4	2.5
34E	Campcreek -Skullgulch association	12-35	>60	Extreme to very steep slopes	13.9	Yes	Well drained	C	39.2	37.3	23.5
83E	Inkler very gravelly loam	35-50	>15-30, >30-45	Extreme to very steep slopes	2.07	No	Well drained	B	35	50	15

*HG=Hydrologic Group

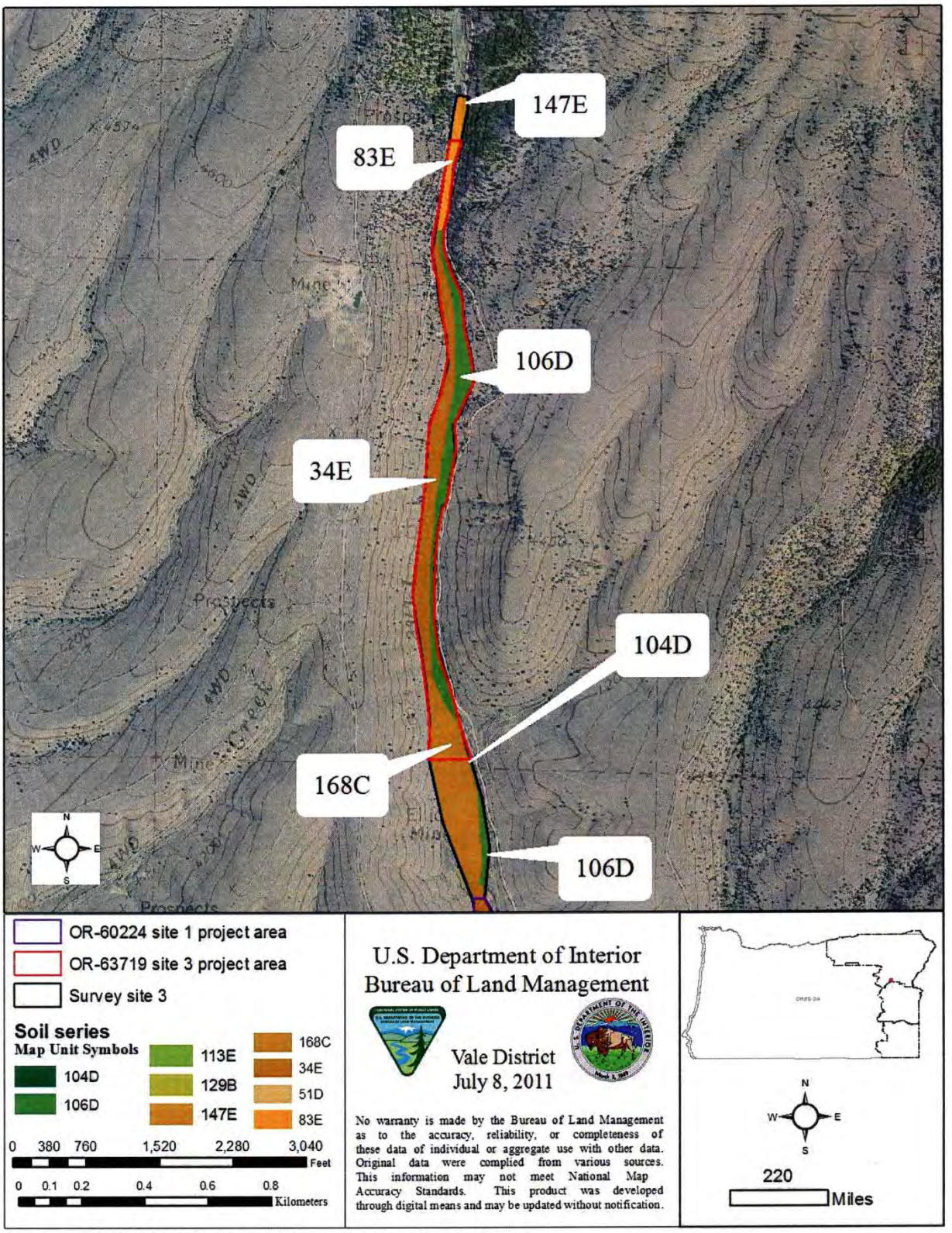


Figure 3. OR-63719 site 3 and survey site 3 soil series

Pine Creek Valley Bottom (OR-60224 Site 1)

Map Unit	Soil series	Soil Survey slope %	Dominant slope percent calculation inside study area/map unit	slope classification	acres	Highly Erodible Land (HEL)	Drainage	HG	Sand % surface horizon	Silt % surface horizon	Clay % surface horizon
106D	Marack very gravelly silt clay loam	12-35	>50	Extreme to very steep slopes	1.49	Yes	Well drained	C	20	49	31
34E	Campcreek -Skullgulch association	12-35	>60	Extreme to very steep slopes	8.95	Yes	Well drained	C	39.2	37.3	23.5
129B	Rastus very gravelly loam	1-7	>15-30	Strong slopes	0.81	No	Well drained	C	39.2	37.3	23.5
51D	Encima gravelly silt loam	12-35	>60	Extreme to very steep slopes	10.78	No	Well drained	B	24.8	52.7	22.5
113E	Nagle silt loam	35-50	>60	Extreme to very steep slopes	25.44	No	Well drained	B	26.5	53.5	20

*HG=Hydrologic Group

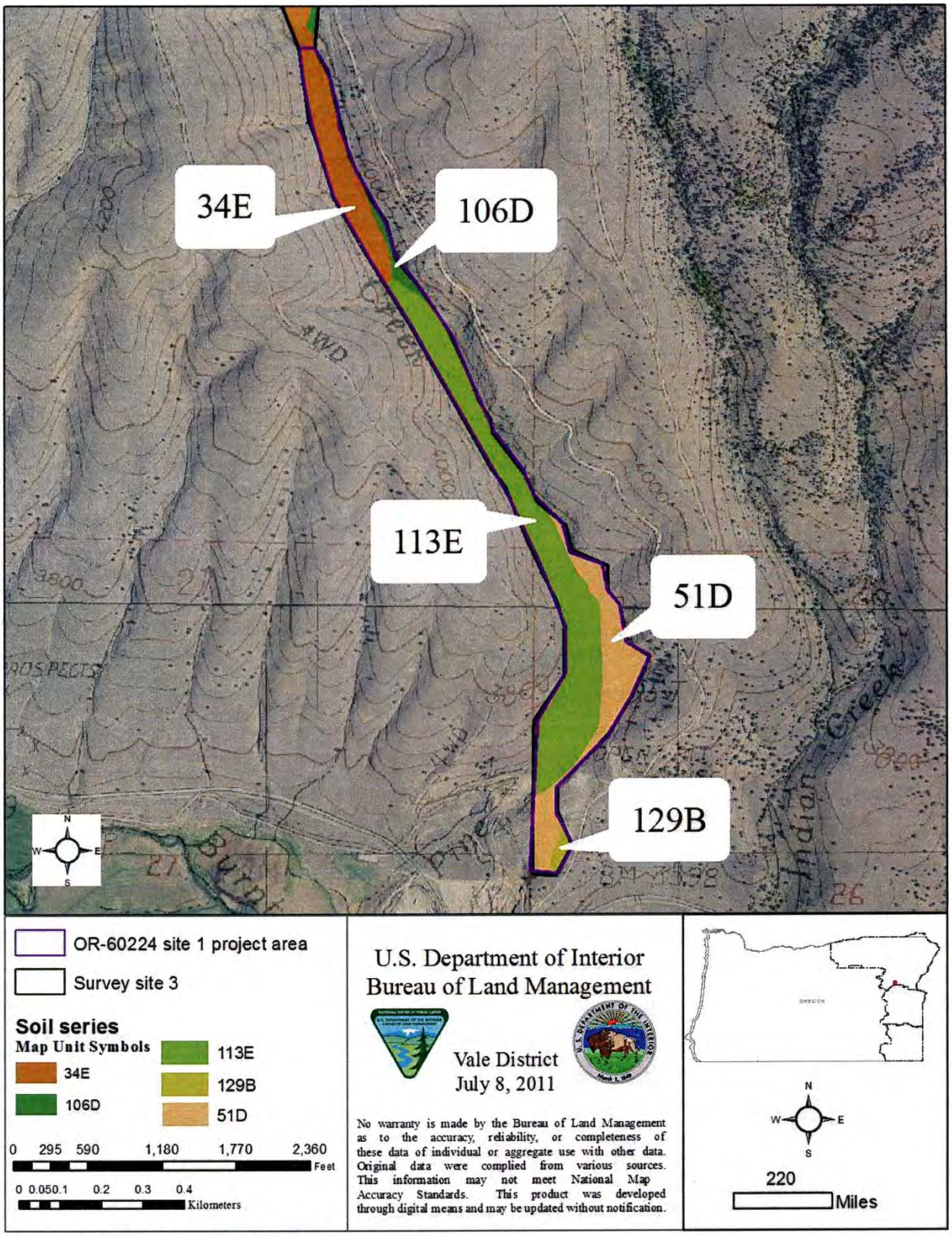


Figure 4. OR-60224 site 1 and survey site 3 soil series

Table 2. Project Area Soil series profile saturated hydraulic conductivity (Ksat)

Map unit	horizon (inches)	texture composition	Saturated Hydraulic Conductivity (Ksat) (in/hr)	Ksat class
33C	0 to 11	gravelly silty loam	0.53 -1.84	Moderately high to high
	11 to 26	silty clay loam	0.18-0.53	Moderately high
	26 to 51	silty clay loam	0.18-0.53	Moderately high
	51 to 88	gravelly sandy clay loam	0.18-0.53	Moderately high
34D	0 to 8	very gravelly loam	0.53 -1.84	Moderately high to high
	8 to 15	clay loam	0.53 -1.84	Moderately high to high
	15 to 65	clay	0.06-0.18	Moderately low to moderately high
34E	0 to 8	very gravelly loam	0.53 -1.84	Moderately high to high
	8 to 15	clay loam	0.53 -1.84	Moderately high to high
	15 to 65	clay	0.06-0.18	Moderately low to moderately high
51D	0 to 4	gravelly silty loam	0.53 -1.84	Moderately high to high
	4 to 7	clay loam	0.06-0.18	Moderately low to moderately high
	7 to 12	clay	0.06-0.18	Moderately low to moderately high
	12 to 18	silty clay loam	0.06-0.18	Moderately low to moderately high
	18 to 42	silt loam	0.18-0.55	Moderately high
	42 to 60	extremely gravelly loam	0.18-0.55	Moderately high
80E	0 to 3	very gravelly clay loam	0.18-0.53	Moderately high to high
	3 to 26	very gravelly clay	0.06-0.18	Moderately low to moderately high
	26 to 60	extremely gravelly loamy sand	0.06-0.18	Moderately low to moderately high
83E	0 to 2	slightly decomposed plant material	55.16-92.59	Very high
	2 to 3	moderately decomposed plant material	55.16-92.60	Very high
	3 to 15	very gravelly loam	0.53-1.84	Moderately high to high
	15 to 26	extremely gravelly loam	0.53-1.85	Moderately high to high
	26 to 65	extremely cobbly loam	0.53-1.86	Moderately high to high

104	0 to 12	silt loam	0.53-1.86	Moderately high to high
	12 to 25	silty clay	0.06-0.18	Moderately low to moderately high
	25 to 34	clay loam	0.18-0.52	Moderately low to moderately high
	34 to 47	very gravelly loam	1.84-5.52	High
	47 to 51	weathered bedrock	-	-

106D	0 to 12	gravelly silty clay loam	0.18-0.52	Moderately low to moderately high
	12 to 25	silty clay	0.06-0.18	Moderately low to moderately high
	25 to 34	clay loam	0.18-0.52	Moderately low to moderately high
	34 to 47	very gravelly loam	1.84-5.52	High
	47 to 51	weathered bedrock	-	-

113E	0 to 18	silt loam	0.53-1.86	Moderately high to high
	18 to 34	silty clay loam	0.18-0.52	Moderately low to moderately high
	34 to 60	gravelly silty clay loam	0.18-0.53	Moderately low to moderately high

129B	0 to 4	very gravelly loam	0.53-1.86	Moderately high to high
	4 to 12	gravelly clay loam	0.18-0.52	Moderately low to moderately high
	12 to 24	clay	0.06-0.18	Moderately low to moderately high
	24 to 37	cemented material	0.001-0.06	Low to moderately low
	37 to 60	extremely gravelly sandy loam	5.52-18.52	High to Very high

147E	0 to 1	slightly decomposed plant material	5.52-92.59	High to Very High
	1 to 6	very gravelly loam	0.53-1.86	Moderately high to high
	6 to 22	very gravelly loam	0.53-1.86	Moderately high to high
	22 to 41	very gravelly sandy loam	1.84-5.52	High
	41 to 61	extremely gravelly loamy sand	1.84-5.52	High

168C	0 to 99	extremely cobbly loamy sand	18.52-92.59	Very High

SOILS DESCRIPTIONS-in numerical map unit number

33C-Burntriver gravelly silt loam, 2 to 12 percent slopes. This deep, well drained soil is on low stream terraces and alluvial fans. It formed in mixed alluvium influenced by loess and volcanic ash in the surface layer. Areas are irregular in shape and are 40 to 200 acres in size. The native vegetation is mainly bunchgrasses, shrubs, and forbs. Elevations range from 3,800 to 4,000 feet. The average annual precipitation is 9 to 12 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 60 to 90 days.

Typically, the surface layer is dark grayish brown gravelly silt loam about 11 inches thick. The next layer is dark grayish brown silty clay loam about 15 inches thick. The upper 25 inches of the subsoil is dark grayish brown silty clay loam. The lower 9 inches is dark grayish brown gravelly clay loam. The substratum to a depth of 60 inches or more is yellowish brown gravelly sandy clay loam. Included in this unit are small areas of Marack soils. Also included are small areas of Burntriver soils that have a surface layer of silt loam. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another. Permeability is moderate to a depth of about 11 inches in the Burntriver soil and moderately slow below that depth. Available water capacity is 8 to 12 inches. The effective rooting depth is 60 inches or more. Runoff is slow or medium, and the hazard of water erosion is slight or moderate

This unit is used mainly for livestock grazing. It also provides habitat for many kinds of wildlife. The potential plant community on this unit is dominated by Idaho fescue, needle-and-thread, and Wyoming big sagebrush. Idaho fescue and needle-and-thread are the major forage-producing plants. If the site is in excellent condition, the total annual production is estimated at 1,500 pounds per acre in favorable years and 500 pounds per acre in unfavorable years. If the condition of the site deteriorates through overgrazing, Idaho fescue loses vigor and decreases in extent. Thurber needlegrass, needle-and-thread, Wyoming big sagebrush, and Sandberg bluegrass increase in extent. If deterioration continues, the extent of needlegrass decreases and cheatgrass and other annual grasses and forbs invade the site. The Burntriver soil is in the Mountain Loamy 9-12pz range site.

34D-Campcreek-Skullgulch association, 12 to 35 percent slopes. This map unit is on terrace side slopes. Areas are irregular in shape and are 100 to 400 acres in size. The native vegetation is mainly bunchgrasses, forbs, and shrubs. Elevations range from 4,000 to 4,700 feet. The average annual precipitation is 12 to 16 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 60 to 90 days.

This unit is about 45 percent Campcreek very gravelly loam and 40 percent Skullgulch silt loam. Campcreek soils are on south and west aspects, and Skullgulch soils are on north and east aspects. Included in this unit are small areas of Nagle soils. Also included are small areas of soils that are similar to the Campcreek soil but are less than 40 inches deep to consolidated sediments. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

The Campcreek soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is very dark grayish-brown very gravelly loam about 8 inches thick. The upper part of the subsoil is very dark grayish brown clay loam about 7inches thick. The lower part is about 50 inches of dark yellowish-brown and dark brown clay and silty clay. Depth to the substratum is 60 inches or more. Permeability is moderate to a depth of about 15 inches in the Campcreek soil and slow below that depth. Available

water capacity is 9 to 11 inches. The effective rooting depth is limited by the dense clay layer at a depth of 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate or high.

The Skullgulch soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is very dark grayish brown and dark brown silt loam about 20 inches thick. The next layer is dark brown clay loam about 4 inches thick. The upper 15 inches of the subsoil is dark yellowish brown clay. The lower 21 inches is dark yellowish brown clay loam. Depth to the substratum is 60 inches or more. Permeability is moderately slow to a depth of about 24 inches in the Skullgulch soil and slow below that depth. Available water capacity is 8 to 11 inches. The effective rooting depth is limited by the dense clay layer at a depth of 20to 30 inches. Runoff is medium, and the hazard of water erosion is moderate or high.

This unit is used mainly for livestock grazing. It also provides habitat for many kinds of wildlife. The potential plant community on the Campcreek soil is dominated by bluebunch wheatgrass, Idaho fescue, big sagebrush, squaw apple, and bitterbrush. Bluebunch wheatgrass and Idaho fescue are the major forage-producing plants. If the site is in excellent condition, the total annual production is estimated at 1,400 pounds per acre in favorable years and 700 pounds per acre in unfavorable years. The potential plant community on the Skullgulch soil is dominated by Idaho fescue, squaw apple, and mountain bigsagebrush. Idaho fescue is the major forage-producing plant. If the site is in excellent condition, the total annual production is estimated at 2,200 pounds per acre in favorable years and1,000 pounds per acre in unfavorable years. If the condition of the site deteriorates through overgrazing, Idaho fescue loses vigor and decreases in extent. Mountain big sagebrush and Sandberg bluegrass increase in extent. If deterioration continues, mountain big sagebrush strongly increases on the north slope of the Skullgulch soil, and cheatgrass, soft brome, and other annual plants invade the site. The Campcreek soil is in the Mountain South12-16pz range site. The Skullgulch soil is in the Mountain North 12-16pz range site.

34E-Campcreek-Skullgulch association, 35 to 60percent slopes. This map unit is on terrace side slopes. Areas are irregular in shape and are 100 to 400 acres in size. The native vegetation is mainly bunchgrasses, forbs, and shrubs. Elevation is 4,000 to 4,700 feet. The average annual precipitation is 12 to 16 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 60 to 90 days.

This unit is about 45 percent Campcreek very gravelly loam and 40 percent Skullgulch silt loam. Campcreek soils are on south and west aspects, and Skullgulch soils are on north and east aspects. Included in this unit are small areas of soils that are similar to these soils but are less than 40 inches deep to consolidated sediments. Also included are small areas of Badland on south-facing slopes. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

The Campcreek soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is very dark grayish brown very gravelly loam about 8 inches thick. The upper part of the subsoil is very dark grayish brown clay loam about 7 inches thick. The lower part is about 50 inches of dark yellowish brown and dark brown clay and silty clay. Depth to the substratum is 60 inches or more. Permeability is moderate to a depth of about 15 inches in the Campcreek soil and slow below that depth. Available water capacity is 9 to 11 inches. The effective rooting depth is limited by the dense clay layer at a depth of 10 to 30 inches. Runoff is rapid, and the hazard of water erosion is high or very high.

The Skullgulch soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is very dark grayish brown and dark brown silt loam about 20 inches thick. The next layer is dark brown clay loam about 4 inches thick. The upper 15 inches of the subsoil is dark yellowish brown clay. The lower 21 inches is dark yellowish brown clay loam. Depth to the substratum is 60 inches or more. Permeability is moderate to a depth of about 24 inches in the Skullgulch soil and slow below that depth. Available water capacity is 8 to 11 inches. The effective ro6ting depth is limited by the dense clay layer at a depth of 20 to 30 inches. Runoff is rapid, and the hazard of water erosion is high or very high.

This unit is used mainly for livestock grazing. It also provides habitat for many kinds of wildlife. The potential plant community on the Campcreek soil is dominated by bluebunch wheatgrass, Idaho fescue, big sagebrush, and squaw apple. Bluebunch wheatgrass and Idaho fescue are the major forage-producing plants. If the site is in excellent condition, the total annual production is estimated at 1,400 pounds per acre in favorable years and 700 pounds per acre in unfavorable years. Livestock access is limited by the slope. The potential plant community on the Skullgulch soil is dominated by Idaho fescue, bluebunch wheatgrass, squaw apple, and big sagebrush. Idaho fescue is the major forage-producing plant. If the site is in excellent condition, the total annual production is estimated at 2,200 pounds per acre in favorable years and 100 pounds per acre in unfavorable years. Livestock access is limited by the slope. If the condition of the site deteriorates through overgrazing, bluebunch wheatgrass and Idaho fescue lose vigor and decrease in extent. Mountain big sagebrush and Sandberg bluegrass increase in extent. If deterioration continues, mountain big sagebrush strongly increases on the north slope of the Skullgulch soil, and cheatgrass, soft brome, and other annual plants invade the site. Mechanical treatment for brush control and range seeding is not practical because of the slope. The Campcreek soil is in the Mountain South 12-16pz range site. The Skullgulch soil is in the Mountain North 12-16pz range site.

50C-Encina gravelly silt loam, 2 to 12 percent slopes. This deep, well drained soil is on terraces. It formed in mixed lacustrine sediments. Areas are irregular in shape and are 40 to 200 acres in size. The native vegetation is mainly bunchgrasses, forbs, and shrubs. Elevation is 2,800 to 3,800 feet. The average annual precipitation is 9 to 12 inches, the average annual air temperature is 45 to 50 degrees F, and the average frost-free period is 110 to 130 days.

Typically, the surface layer is very dark grayish brown gravelly silt loam about 4 inches thick. The next layer is dark brown clay loam about 3 inches thick. The upper part of the subsoil is dark brown clay about 5 inches thick. The lower part is about 30 inches of dark yellowish brown and grayish brown, calcareous silty clay loam and silt loam. The substratum to a depth of 60 inches or more is multicolored extremely gravelly loam. Included in this unit are small areas of Poall and Virtue soils. Also included are small areas of soils that are similar to the Encina soil but have cobbles on the surface. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another. Permeability is moderate to a depth of about 4 inches in the Encina soil and slow below that depth. Available water capacity is 7 to 10 inches. The effective rooting depth is limited by the weakly cemented, extremely gravelly substratum at 40 to 60 inches. Runoff is slow or medium, and the hazard of water erosion is slight or moderate.

This unit is used mainly for livestock grazing. It also is used for irrigated hay and pasture, and it provides habitat for many kinds of wildlife. The potential plant community on this unit is dominated by Idaho fescue and Wyoming big sagebrush. Idaho fescue is the major forage-producing plant. If the site is in excellent condition, the total annual production is estimated at 1,500 pounds per acre in favorable years and 500 pounds per acre in unfavorable years. If the condition of the site deteriorates through

overgrazing, Idaho fescue loses vigor and decreases in extent. Wyoming big sagebrush, bluebunch wheatgrass, and Sandberg bluegrass increase in extent. If deterioration continues, the extent of bluebunch wheatgrass decreases and unpalatable annual grasses and forbs invade the site. This unit is suited to irrigated hay and pasture. Management that maintains the optimum vigor and quality of forage plants is needed. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and control erosion. Periodic mowing and clipping help to maintain uniform growth and prevent selective grazing. In summer irrigation is needed for the maximum production of hay. Sprinkler irrigation is a suitable method of applying water. It permits the even, controlled application of water, helps to control runoff, and minimizes the risk of erosion. To avoid over-irrigation and the leaching of plant nutrients, applications of irrigation water should be adjusted to the available water capacity, the rate of water intake, and the needs of the crop. Fertilizer is needed to ensure the optimum growth of grasses and legumes. A cropping system that includes grasses, legumes, or grass-legume mixtures helps to maintain soil fertility and filth. Conducting fieldwork during wet periods results in deterioration of tilth and destroys soil structure. As a result, it increases the runoff rate and the hazard of erosion. Runoff and erosion can be controlled by crop residue management and by rough or minimum tillage or stubble-mulching. All tillage should be on the contour or across the slope. Grazing during wet periods results in compaction of the surface layer, poor tilth, and excessive runoff. Compaction limits the movement of air and water in the soil and restricts the growth of roots. A wide variety of trees and shrubs can be grown as windbreaks and environmental plantings on this soil. Seedling mortality is severe because the high content of clay causes moisture stress in the seedlings. Cultivation or applications of herbicide help to remove competing vegetation. The Encina soil is in the Mountain Clayey 9-12pz range site.

51D-Encina gravelly silt loam, 12 to 35 percent south slopes. This deep, well-drained soil is on terraces. It formed in mixed lacustrine sediments. Areas are irregular in shape and are 40 to 200 acres in size. The native vegetation is mainly bunchgrasses, forbs, and shrubs. Elevation is 2,800 to 3,800 feet. The average annual precipitation is 9 to 12 inches, the average annual air temperature is 45 to 50 degrees F, and the average frost-free period is 110 to 130 days.

Typically, the surface layer is very dark grayish brown gravelly silt loam about 4 inches thick. The next layer is dark brown clay loam about 3 inches thick. The upper part of the subsoil is dark brown clay about 5 inches thick. The lower part is about 30 inches of dark yellowish brown and grayish brown, calcareous silty clay loam and silt loam. The substratum to a depth of 60 inches or more is multicolored extremely gravelly loam. Included in this unit are small areas of Poall and Legler soils. Also included are small areas of soils that are similar to the Encina soil but have cobbles on the surface. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another. Permeability is moderate to a depth of about 4 inches in the Encina soil and slow below that depth. Available water capacity is 7 to 10 inches. The effective rooting depth is limited by the weakly cemented, extremely gravelly substratum at 40 to 60 inches. Runoff is medium, and the hazard of water erosion is moderate or high.

This unit is used mainly for livestock grazing. It also provides habitat for many kinds of wildlife. The potential plant community on this unit is dominated by bluebunch wheatgrass and Wyoming big sagebrush. Bluebunch wheatgrass is the major forage-producing plant. If the site is in excellent condition, the total annual production is estimated at 1,200 pounds per acre in favorable years and 400 pounds per acre in unfavorable years. If the condition of the site deteriorates through overgrazing, bluebunch wheatgrass loses vigor and decreases in extent. Sandberg bluegrass and Wyoming big

sagebrush increase in extent. If deterioration continues, annual grasses and forbs invade the site. The Encina soil is in the Clayey South 9-12pz range site.

104D-Marack silt loam, 12 to 35 percent north slopes. This deep, well-drained soil is on low terraces. It formed in mixed lacustrine sediments. Areas are irregular in shape and are 100 to 400 acres in size. The native vegetation is mainly bunchgrasses, forbs, and shrubs. Elevation is 3,800 to 4,400 feet. The average annual precipitation is 9 to 12 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 60 to 90 days.

Typically, the surface layer is very dark grayish brown silt loam about 12 inches thick. The upper 13 inches of the subsoil is dark brown and dark yellowish brown clay and silty clay. The lower 22 inches is yellowish brown clay loam and very gravelly loam. The depth to lacustrine sediments is typically 40 to 60 inches but is more than 60 inches in some areas. Included in this unit are small areas of Marack soils that have a surface layer of gravelly silty clay loam. Also included are small areas of soils that are similar to the Marack soil but are less than 40 inches deep to lacustrine sediments. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another. Permeability is moderate to a depth of about 12 inches in the Marack soil and slow below that depth. Available water capacity is 6 to 9 inches. The effective rooting depth is 40 to 60 inches. Runoff is medium, and the hazard of water erosion is moderate or high.

This unit is used mainly for livestock grazing. It also provides habitat for many kinds of wildlife. The potential plant community on this unit is dominated by Idaho fescue and Wyoming big sagebrush. Idaho fescue is the major forage-producing plant. If the site is in excellent condition, the total annual production is estimated at 1,700 pounds per acre in favorable years and 600 pounds per acre in unfavorable years. If the condition of the site deteriorates through overgrazing, Idaho fescue loses vigor and decreases in extent. Sandberg bluegrass and Wyoming big sagebrush increase in extent. If deterioration continues, annual grasses and forbs invade the site. The Marack soil is in the Mountain North 9-12pz range site.

106D-Marack very gravelly silty clay loam, 12 to 35 percent south slopes. This deep, well-drained soil is on low terraces. It formed in lacustrine sediments. Areas are irregular in shape and are 100 to 400 acres in size. The native vegetation is mainly bunchgrasses, shrubs, and forbs. Elevation is 3,800 to 4,400 feet. The average annual precipitation is 9 to 12 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 60 to 90 days.

Typically, the surface layer is very dark grayish brown very gravelly silty clay loam about 12 inches thick. The upper 13 inches of the subsoil is dark brown and dark yellowish brown clay and silty clay. The lower 22 inches is yellowish brown clay loam and very gravelly loam. The depth to lacustrine sediments is typically 40 to 60 inches but is more than 60 inches in some areas. Included in this unit are small areas of Marack soils that have a surface layer of silt loam and small areas of Badland. Also included are small areas of soils that are similar to the Marack soil but are less than 40 inches deep to lacustrine sediments. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another. Permeability is moderately slow to a depth of about 12 inches in the Marack soil and slow below that depth. Available water capacity is 5 to 8 inches. The effective rooting depth is 40 to 60 inches. Runoff is medium, and the hazard of water erosion is moderate or high.

This unit is used mainly for livestock grazing. It also provides habitat for many kinds of wildlife. The potential plant community on this unit is dominated by bluebunch wheatgrass and Wyoming big

sagebrush. Bluebunch wheatgrass is the major forage-producing plant. If the site is in excellent condition, the total annual production is estimated at 1,200 pounds per acre in favorable years and 400 pounds per acre in unfavorable years. Livestock access on this unit may be limited by the rock fragments on the surface. If the condition of the site deteriorates through overgrazing, bluebunch wheatgrass loses vigor and decreases in extent. Sandberg bluegrass and Wyoming big sagebrush increase in extent. If deterioration continues, cheatgrass and other annual grasses and forbs invade the site. Mechanical treatment for range seeding and brush control may be limited by the very gravelly surface layer. The Marack soil is in the Clayey South 9-12pz range site.

107C-Marack complex, 2 to 12 percent slopes. This map unit is on low terraces. Areas are irregular in shape and are 100 to 400 acres in size. The native vegetation is mainly bunchgrasses, forbs, and shrubs. Elevation is 3,800 to 4,400 feet. The average annual precipitation is 9 to 12 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 60 to 90 days.

This unit is about 50 percent Marack gravelly silty clay loam and 40 percent Marack silt loam. Marack gravelly silty clay loam is in convex areas, and Marack silt loam is in concave areas. Included in this unit are small areas of soils that are similar to the Marack soils but are less than 40 inches deep to lacustrine sediments. Included areas make up about 10 percent of the total acreage. The percentage varies from one area to another. The Marack soils are deep and well drained. They formed in lacustrine sediments. Typically, the surface layer is about 12 inches of very dark grayish brown gravelly silty clay loam or silt loam. The upper 13 inches of the subsoil is dark brown and dark yellowish brown clay and silty clay. The lower 22 inches is yellowish brown clay loam and very gravelly loam. The depth to lacustrine sediments is typically 40 to 60 inches but is more than 60 inches in some areas. Permeability is moderate or moderately slow to a depth of about 12 inches in the Marack soils and slow below that depth. Available water capacity is 5 to 9 inches. The effective rooting depth is 40 to 60 inches. Runoff is slow or medium, and the hazard of water erosion is slight or moderate.

This unit is used mainly for livestock grazing. It also provides habitat for many kinds of wildlife. The potential plant community on this unit is dominated by Idaho fescue and Wyoming big sagebrush. Idaho fescue is the major forage-producing plant. If the site is in excellent condition, the total annual production is estimated at 1,500 pounds per acre in favorable years and 500 pounds per acre in unfavorable years. If the condition of the site deteriorates through overgrazing, Idaho fescue loses vigor and decreases in extent. Wyoming big sagebrush, bluebunch wheatgrass, and Sandberg bluegrass increase in extent. If deterioration continues, the extent of bluebunch wheatgrass decreases and annual grasses and forbs invade the site. The Marack soils are in the Mountain Clayey 9-12pz range site.

113E-Nagle silt loam, 35 to 50 percent north slopes. This deep, well-drained soil is on the side slopes of dissected terraces. It formed in mixed alluvium influenced by volcanic ash and loess in the surface layer. Areas are irregular in shape and are 40 to 200 acres in size. The native vegetation is mainly bunchgrasses, shrubs, and forbs. Elevation is 3,000 to 4,500 feet. The average annual precipitation is 9 to 12 inches, the average annual air temperature is 42 to 45 degrees F, and the average frost-free period is 80 to 110 days.

Typically, the surface layer is very dark brown silt loam about 18 inches thick. The upper part of the subsoil is very dark grayish brown and dark brown silty clay loam about 16 inches thick. The lower part to a depth of 60 inches or more is brown gravelly silty clay loam. Included in this unit are small areas of Encina soils and small areas of Nagle soils that have a surface layer of gravelly silt loam. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

Permeability is moderate to a depth of about 18 inches in the Nagle soil and moderately slow below that depth. Available water capacity is 8 to 11 inches. The effective rooting depth is 60 inches or more. Runoff is rapid, and the hazard of water erosion is high. This unit is used mainly for livestock grazing. It also provides habitat for many kinds of wildlife. The potential plant community on this unit is dominated by Idaho fescue and Wyoming big sagebrush. Idaho fescue is the major forage-producing plant. If the site is in excellent condition, the total annual production is estimated at 1,700 pounds per acre in favorable years and 600 pounds per acre in unfavorable years. Livestock access is limited by the slope. If the condition of the site deteriorates through overgrazing, Idaho fescue loses vigor and decreases in extent. Sandberg bluegrass and Wyoming big sagebrush increase in extent. If deterioration continues, annual grasses and forbs invade the site. Mechanical treatment for brush control and range seeding is not practical because of the slope. The Nagle soil is in the Mountain North 9-12pz range site.

129B-Rastus very gravelly loam, 1 to 7 percent slopes. This well-drained soil is on terraces. It is moderately deep to a duripan. It formed in mixed alluvium. Areas are irregular in shape and are 80 to 200 acres in size. The native vegetation is mainly bunchgrasses, forbs, and shrubs. Elevation is 4,000 to 4,700 feet. The average annual precipitation is 12 to 16 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 60 to 90 days.

Typically, the surface layer is very dark grayish brown very gravelly loam about 4 inches thick. The next layer is very dark grayish brown gravelly clay loam about 8 inches thick. The upper part of the subsoil is dark yellowish brown clay about 7 inches thick. The next part is dark yellowish brown gravelly clay about 5 inches thick. The lower part is a brownish yellow, massive duripan about 13 inches thick. The substratum to a depth of 60 inches or more is multicolored extremely gravelly sandy loam. The depth to a duripan is 20 to 30 inches. Included in this unit are small areas of Wahstal soils. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another. Permeability is slow above the duripan in the Rastus soil. Available water capacity is 3 to 5 inches. The effective rooting depth is 20 to 30 inches. Runoff is slow, and the hazard of water erosion is slight or moderate.

This unit is used mainly for livestock grazing. It also provides habitat for many kinds of wildlife. The potential plant community on this unit is dominated by Idaho fescue and mountain big sagebrush. Idaho fescue is the major forage-producing plant. If the site is in excellent condition, the total annual production is estimated at 2,000 pounds per acre in favorable years and 1,000 pounds per acre in unfavorable years. If the condition of the site deteriorates through overgrazing, Idaho fescue loses vigor and decreases in extent. Big sagebrush, bluebunch wheatgrass, and Sandberg bluegrass increase in extent. If deterioration continues, the extent of bluebunch wheatgrass decreases, the extent of big sagebrush strongly increases, and annual grasses and forbs invade the site. The Rastus soil is in the Mountain Clayey 12-16pz range site.

Habitat Mitigation Plan for Greater Sage-Grouse

Introduction

The BLM preferred alternative, Alternative 2, would authorize new placer mining disturbances on 209 acres of public lands located on upper Pine Creek, Brannon Gulch, and Reeds Gulch in the Baker Resource Area **(Figure 1)**. Within the project area boundary, mining operations would include 200 feet of new road construction, 6,335 feet of road reconstruction, 10,000 feet of widening existing roads and removal of vegetation on 209 acres. The proponent, High Bar Mining LLC, would disturb between 5 and 15 acres annually, in 5 acre parcels. Once all the paydirt is processed and valuable minerals removed, reclamation would be started by backfilling excavations with sorted materials, recontouring, replacing topsoil, and seeding disturbed areas.

The project area is comprised of sagebrush steppe vegetation, classified by the BLM as preliminary general habitat (PGH) and low density, Category 2, habitat by Oregon Department of Fish and Wildlife (ODFW). Core sage-grouse habitat does not occur within or in close proximity to the project area.

The project area is located in an area of low lek densities; there are only three leks within nine miles of the project boundary. The closest lek, Elliot Mine, is 900 feet from the southern boundary and 7,500 feet from the northern boundary of the proposed mining operation. ODFW classified the Elliot Mine lek as small, 1-6 males per year. Mining will occur during the critical breeding and brood rearing season, therefore the indirect impact associated with mining noise would need to be mitigated. However, according to the BLM noise analysis the BLM expects that the Elliot Mine lek would only be impacted during the breeding season (March 1-April 31) when Processing Site 3 is in use (see Vicinity Map in Appendix A).

The project area is within the Baker sage-grouse subdivision of the Oregon population. Unlike the overall sage-grouse population trend for the entire state of Oregon, stable to slight decline, the Baker subdivision was determined by ODFW as having a non-significant downward trend (ODFW, 2011).

This Habitat Mitigation Plan (HMP) describes mitigation actions for both direct (i.e., ground disturbance) and indirect (i.e., noise) impacts on sage-grouse habitat by implementing Alternative 2 (EA, pages 18-21). This HMP is based on ODFW's Greater Sage-grouse Conservation Assessment and Strategy of Oregon (Hagen 2011) and the revised Mitigation Framework for Sage-grouse Habitats (ODFW 2012).

The HMP identifies the area to be mitigated and describes mitigation actions and priority locations for mitigation **(Figure 2)**. The HMP provides a general timeline and funding of mitigation work.

The main participants in implementing mitigation for the proposed mining are the proponent, High Bar Mining LLC, and the BLM. The proponent will be responsible for implementing offsite mitigation on public lands or paying the BLM to complete mitigation treatment on public lands through a Memorandum of Understanding with the BLM. The BLM would be responsible for implementation and effectiveness monitoring and authorizing treatment of juniper on public lands. The specific timing, locations, and types of mitigation actions would be approved by the BLM, and the BLM would determine when mitigation is successful.

Description of the Mitigated Impacts

The proposed placer operations are described in detail in Chapter 2, pages 6-16 of the High Bar Placer Group (OR 63719) & Upper and Lower Pine Creek Mining (OR 60224) EA. Ground disturbing actions that would be mitigated are areas where mineral extraction occurs, the construction or widening of existing access roads, and the areas impacted by noise.

Mineral Extraction

Disturbance caused by mineral extraction includes the removal of vegetation and stockpiling of overburden and top soil (growth media) for reclamation. Mineral extraction would create 209 new acres of disturbance, 5 to 15 acres annually, in 5 acre parcels. Once all the paydirt is processed with five acres open at a time and valuable minerals removed, reclamation would be started by backfilling excavations with sorted materials, recontouring, replacing topsoil, and seeding with a BLM approved all states native weed free seed mixture which would include mountain big sagebrush seed. The BLM expects grasses and forbs would recover within three years and sagebrush would recover within 10 to 20 years to pre-disturbance stature. The BLM believes that the disturbed areas would have no habitat value to sage-grouse during active mining operations and little habitat value for up to 10 years after reclamation.

Roads

Two hundred feet of new road would be constructed to provide access to Processing Site 5, 6,335 feet of existing road would be reconstructed for ATV access from Well #1 to Well #2, and 10,000 feet of existing roads would be widened by six feet to meet Mine Safety and Health Administration (MSHA) requirements. All road construction and improvements are within the project area boundary; therefore, acreage of disturbance caused by roads is already included in disturbance caused by mineral extraction.

Noise

Mining operations would occur during the critical breeding and brood rearing period (March 1-April 31); therefore, mitigation for temporary noise impacts is necessary. ODFW considers noise associated with mining operations to have an indirect effect to sage-grouse breeding and brood rearing habitat. Specifically, ODFW's stance is that noise above 40 decibels from March 1 to April 30 could cause sage-grouse to avoid an area.

Calculation of the Size of the Mitigation Area

The acreage of off-site mitigation takes into consideration both direct (removal of vegetation) and indirect impacts (mining noise displacing sage-grouse). The calculations BLM used to determine mitigation acreage for direct and indirect impacts are listed below.

Direct Impacts
The BLM estimates there are 196 acres of sage-grouse habitat within the project area that would be disturbed over the 20 year life of the project, which would include new roads, widening of existing roads, processing sites, and clearing of vegetation for excavations. The remaining 13 acres within the project area is the current disturbance footprint of existing system roads that will remain after mining activities are completed. The BLM does not believe roads are suitable sage-grouse habitat; therefore, no offsite mitigation would be required. The mitigation ratio for the direct impacts associated with this project is 1:1; therefore 196 acres of off-site mitigation would be required.

Indirect Impacts
ODFW considers noise associated with mining and processing operations as an indirect impact to sage-grouse habitat. To determine the indirect impact, the BLM asked the proponent for decibel ratings for the mining equipment that would be used on the processing sites. The proponent supplied the BLM with the decibel rating for some equipment listed in the plan of operation. The BLM did a web search to determine decibel ratings for the remaining heavy equipment listed in the plan of operation for which the proponent did not supply the information.

Most of the noise, above 40 decibels, impacting public lands beyond the project boundary for extended periods of time is confined to four Processing Sites: 1, 2, 3, and 5 (**Figure 1**). Therefore, the BLM used the location of the wash plants on these sites as the basis of the noise analysis. The BLM expects that a front end loader (88 decibels), truck (96 decibels) and generator for powering a wash plant (85 decibels) would be the main pieces of equipment used. The BLM also found that at Processing Site 5, where a wash plant wasn't being used, a water pump with generator would have similar decibel ratings; therefore, all the Processing Sites are covered, either with a generator and wash plant or water pump. The combined noise level for the equipment listed above is 97 decibels. The BLM used the following web site to calculate combined decibels for the three pieces of equipment used at the processing sites http://sphere.sourceforge.net/flik/misc/db.html.

To determine the distance from the Processing Sites where noise would impact sage-grouse habitat the BLM used Aylor (1977) to estimate sound attenuation which considers both vegetation and distance. The BLM estimates noise above 40 decibels would extend 1,936 feet from each of the four processing sites. The BLM determined the distance from the processing sites for each of the noise categories recommended in ODFW (2012) revised Mitigation Framework for Sage-grouse Habitats. Since noise is a temporary disturbance and due to the fact the proponent would only use one processing site at a time, the BLM averaged the four processing sites in determining the area impacted by noise (Table 1 below). In addition, the BLM subtracted all non-habitat acres (i.e. existing roads) when calculating the area impacted by noise.

The BLM used direction found in the ODFW mitigation framework to calculate the acreage of mitigation from indirect impacts. Total indirect mitigation is 45 acres. A summary of findings are documented in Table 1.

Table 1. Summary of BLM noise analysis used to calculate the area of indirect impact mitigation acreage. Noise Categories and Mitigation Multiplier were taken from ODFW Mitigation Strategy.

Noise Categories (decibels)	**Distance (feet) at which noise attenuates to corresponding decibel level**	**Area Impacted by Noise (acres)**	**Mitigation Multiplier**	**Indirect Mitigation (acres): Area Impacted x Mitigation Multiplier**
40-44.9	1124-1936	164	0.1	16
45-49.9	633-1123	44	0.4	18
50-54.9	354-632	9	1	9
≥55	0-355	1	2	2

Mitigation Action and Location

One of the biggest threats to sage-grouse habitat within the Baker subdivision is the encroachment of juniper trees, which left unchecked, would reduce native sagebrush and grass cover. The BLM has had great past success in reducing juniper encroachment within the Vale District and expects that treatment in close proximity to upper Pine Creek, Brannon Gulch, and Reeds Gulch would yield similar results.

Description of Offsite Mitigation Areas

The ODFW Mitigation Policy recommends mitigation for Habitat Category 2 impacts to be "in proximity" to a project, and the mitigation area should be located where habitat protection and enhancement are feasible consistent with this plan. Mitigation actions should occur on BLM lands. Potential mitigation areas are identified in **Figure 2** and are located less than three miles from the proposed mining operation. This area is in a mountain big sagebrush steppe community with light to moderate juniper encroachment and is of similar habitat potential as sites that would be disturbed during mining.

Based on the best available science the mitigation areas selected would benefit sage-grouse using the Elliot Mine lek. A more detailed description of the rationale for the selection of the off-site mitigation areas is as follows:

● The mitigation area is on the edge of the Baker subdivision and is in close proximity to the Malheur subdivision. The BLM believes this area is important for the exchange of genetic material between both subdivisions.

● The proposed mitigation areas would expand the beneficial impacts of past and an ongoing juniper encroachment treatment within sage-grouse habitat on public lands.

Mitigation Actions

The goal of mitigation actions in this plan is to improve sagebrush steppe plant communities in proximity to the Pine Creek, Brannon Gulch, and Reeds Gulch area **(Figure 1)**. Several past impacts and current threats to sagebrush steppe communities are present in this area, including but not limited to wildfires, presence of noxious weeds and annual grasses as well as juniper encroachment. Control of juniper encroachment (light to moderate) in sage-grouse habitat has a high success rate with immediate benefits because the juniper canopy has not closed to the extent that it degrades the understory vegetation (Miller et al 2005). Since juniper encroachment is the primary

threat to sage-grouse habitat in Pine Creek, Brannon Gulch, and Reeds Gulch (Hagen 2011) and due to the limited amount of mitigation acres required to offset the disturbance in this HMP, only juniper control was considered for mitigation actions. Juniper control, especially of light to moderately encroaching stands, would be usable sage-grouse habitat within a short period (less than 5yrs).

The objective of this juniper control mitigation is to remove encroaching juniper from specific treatment areas, while maintaining the understory sagebrush-native grassland community. Treatments would include either cutting juniper with chainsaws followed by machine-piling cut trees then burning the piles; or cutting trees with chainsaws then cutting and scattering the branches so they do not stick up more than four feet above the ground. This selective treatment would leave the existing sagebrush cover intact and release understory plants, especially grasses and forbs. The cutting and machine-piling would be used in most areas unless the terrain is too steep for the excavator to maneuver safely or the ground surface is covered with too many or too big of rocks for the excavator to move over safely. Cutting and scattering of the branches would be used in the areas too steep or too rocky for the excavator.

Mitigation Schedule
The proponent would enter into a Memorandum of Understanding with the BLM to treat juniper by cutting methods on public lands in close proximity to the project area. The proponent would be required to treat 241 acres of juniper within 5 years of project implementation for both direct and indirect impacts.

The mitigation schedule is flexible in that a wildfire could burn a planned juniper thinning project which would require the BLM to move the juniper thinning to another mitigation area, which would extend the completion time of mitigation activities. Any new mitigation areas based on the above scenario would be within a three mile radius of the project area.

Monitoring
Monitoring would indicate whether the mitigation was implemented, if it was effective, and if it achieved the goals and objectives. The goal of the mitigation project is to improve sagebrush steppe plant communities in the area of the mining operation so they can provide sage-grouse habitat. The objective is to improve the condition of native plant communities by removing encroaching juniper. Implementation monitoring would be an annual Mitigation Report submitted to ODFW by BLM describing what mitigation was completed, including materials, methods, and area during the previous field season. Effectiveness monitoring may be conducted by either of the participants, but is BLM's responsibility to ensure monitoring is completed. Photo monitoring would be established that shows plant composition and ground cover to monitor the effects of the treatment(s).

Evaluation
Upon completion of offsite mitigations, there would be a meeting with the proponent and the BLM to evaluate mitigations. The BLM as the land manager is responsible for determining the success of offsite mitigations as addressed in this HMP.

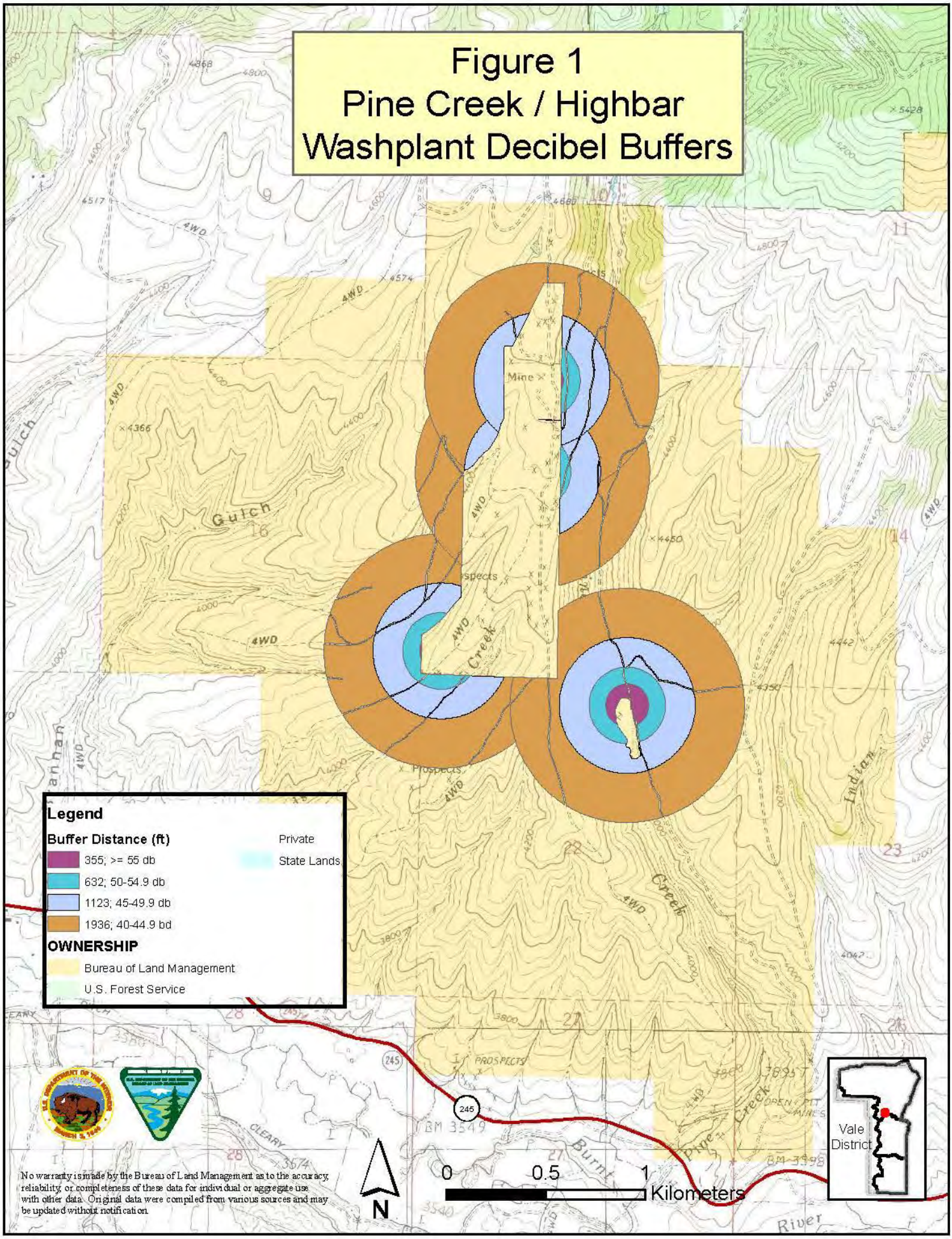


Figure 1
Pine Creek / Highbar
Washplant Decibel Buffers
Legend
Buffer Distance (ft)
355; >= 55 db
632; 50-54.9 db
1123; 45-49.9 db
1936; 40-44.9 bd
OWNERSHIP
Bureau of Land Management
U.S. Forest Service
Private
State Lands
Mine
Gulch
Creek
Indian
Burnt
River
Vale District
0
0.5
1
Kilometers
N
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

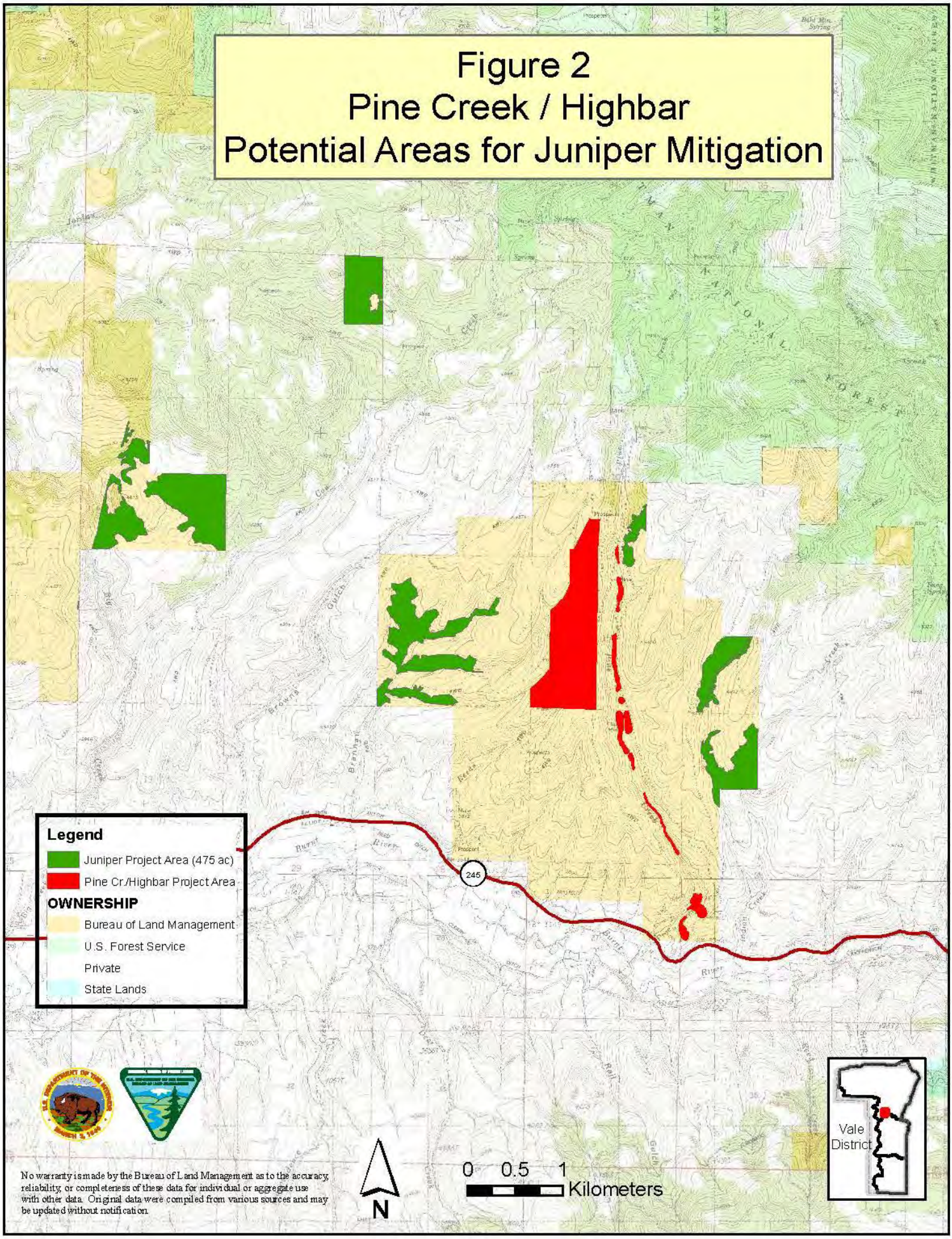


Figure 2
Pine Creek / Highbar
Potential Areas for Juniper Mitigation
Legend
Juniper Project Area (475 ac)
Pine Cr./Highbar Project Area
OWNERSHIP
Bureau of Land Management
U.S. Forest Service
Private
State Lands
245
Vale District
N
0 0.5 1
Kilometers
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Comment Response for High Bar Group and Upper/Lower Pine Creek Mining EA

Oregon Wild, 4/18/2013, Doug Heiken, representative for Oregon Wild:
Comment 1: Review and if necessary recalculate and update reclamation bonds so that reclamation is done to the highest ecological standards.

> *Response:* By regulation (43 C.F.R. 3809.401 and 3809.505, and 3809.556) the operator has to enter in a financial guarantee estimate. The BLM will either concur or not with the operator's evaluation ensuring all BLM's standards and regulations have been met for bonding. All environmental protection measures put on to the Plan of Operations will be taken into account when calculating an adequate bond. Reclamation bonds are updated periodically to account for changes in the economy and pricing of items used in reclamation.

Comment 2: Do all things necessary to protect and restore beds and banks of Pine Creek and other riparian areas.

> *Response:* Alternative #2 (pages 18-21 in the EA) was developed after internal review of the proposed action as entered by the proponent. The purpose of the alternative is to address resource concerns identified by specialists. One of the concerns was the impact to Pine Creek channel and riparian areas should mining occur in the channel bottom. Alternative # 2 limits processing locations to workings allowed under Notice level within the drainage and would reduce proposed mining activity to the ridge. Mining would not occur in the stream bottom and therefore would prevent impacts to Columbia spotted frog and their habitat as well as water quality and the stream channel itself.
> In regards to restoration, mining has occurred in the Pine Creek area since the late 1860s. Current mining laws require the proponent to reclaim only those areas disturbed by the proposed/current operation. It would be beyond the scope of this document to provide for the restoration of the previous impacts from mining along the Pine Creek drainage and in riparian areas.

Comment 3: Minimize water use including addressing ways to control evaporation.

> *Response:* Water Rights are used at the discretion of the State of Oregon Water Resources Department and the holder of the water right. Water for the mining operation will be transported from existing sources through pipelines across federal lands to the processing sites. Once the water has arrived at the processing site it will be recycled through a processing system which will allow sediments to settle and water to be reused for processing. Pipelines are the most efficient form of transport of the water, will be monitored for leaks, and will be repaired as damage and leaks are identified.

Comment 4: Restore hydrologic processes and dynamics including groundwater systems.

> *Response:* As was stated previously, mining has occurred in the Pine Creek drainage since the 1860s. There are multiple water rights for both surface and ground water

specific to mining in these locations of use. There are multiple diversions and earthen structures in the channels from previous mining.
The BLM cannot require the operator to accomplish reclamation to a higher standard than what exists at the start of operations. The operator is not responsible for reclamation over and above the activities approved in the Plan of Operations including stipulations put in place by the analysis.
It would be beyond the scope of this document and the surface management regulations (43 CFR 3809) to restore the surface hydrologic and groundwater systems in the Pine Creek drainage.

Comment 5: BLM should work with the FS to identify ways of minimizing the impacts of the on-stream pond where water is withdrawn from Pine Creek (and transported in a pipeline to Processing Site #1).

Response: The operator is working with the FS under their regulations to account for impacts to the on-stream pond which is under their management. The operator also has an early 20th century established water right for that location at 0.5 cfs from the Water Resources Department with specific requirements to follow. The pipelines on the BLM have not caused any adverse effects, but would be included in a reclamation bond to guarantee removal when mining is completed.

Comment 6: Minimize roads and make sure the roads that are used are properly designed and maintained especially where roads are near streams or cross streams.

Response: Roads will be limited to the existing interim route network and roads needed to conduct the operations of the mine. All roads will be constructed and maintained in accordance to BLM Manuals. Examples of these manuals are 9113-1 Roads Design Handbook, 9113-2 Roads Inventory and Maintenance, and 9115-1 Primitive Roads Design Handbook. Roads that are on the Interim Route Network would be reclaimed to appropriate pre-mining standards.

Comment 7: Avoid and minimize impacts to special status wildlife species such as sage-grouse and Columbia spotted frogs.

Response: BLM is taking steps to minimize impacts to special status wildlife species by incorporating environmental protection measures (EPM) in the development of alternatives. Specific EPMs added by the BLM can be found in Alternative 2 under section l. Environmental Protection Measures (page 21) within the EA. The operator proposed some EPMs based on contact with other agencies in the proposed action under Environmental Protection Measures (page 16).
The EPMs were based upon specific BLM direction through IM 2012-043, current scientific information and coordination efforts with state and federal wildlife agencies. A specific Habitat Mitigation Plan (Appendix E) was created for the sage-grouse habitat to prevent a net habitat loss from direct and indirect effects to the species.

Comment 8: Pine Creek appears to be an important area for the spotted frogs.

Response: Pine Creek is an important area for spotted frogs. Specifically, Pine Creek is the only known drainage that supports Columbia spotted frog populations within the Burnt River Valley. The next closest area with documented occurrence of frog activity within BLM lands is over 14 miles away in Mormon Basin.

Comment 9: Impose clear requirements to protect native vegetation and avoid weeds throughout the project area.

Response: Areas cleared of native vegetation due to mining related ground disturbance activities will be reclaimed by mulching with weed free straw and planted with all states certified noxious weed free seed in the fall with the intent to establish a vegetative ground cover by the following spring (pgs. 58-59). These areas will be monitored for three years following the seeding. Monitoring would include invasive species identification, and percentage of native revegetation coverage in seeded areas. If reseeding does not meet BLM revegetation standards, the operator would be notified and the area would be seeded again (p. 16).

Traveling through weed patches with equipment and personnel would be avoided when possible, especially when plants are seeding, to prevent the spread of weed species. When traveling in known weed infestations, especially Mediterranean sage in the High Bar Plan area, equipment would be cleaned, with an emphasis on the undercarriage and moving parts, before moving into other areas to work. Equipment wash-up areas will be monitored and treated for emerging weeds (pgs. 17, 22).

Additional actions targeted at maintaining roadsides, tailings, dried sediment from settling ponds in a weed-free state through ongoing treatment and monitoring and processing mined materials at the closest processing site from which it was mined will aid in reducing spread of noxious weeds (p. 17, 22).

F. Prescott Ward, V.M.D., Ph.D., 4/19/2013:

Comment 10: I request that the proposed BLM restrictions suggested in the Environmental Assessment on High Bar mining activities related to Greater sage-grouse and Columbia spotted frogs be removed and a Finding of No Significant Impact be registered with respect to the potential impacts on wildlife.

Response: Based on Blickley et. Al. (2012) the BLM expects noise associated with the mining operation would cause the Elliot Mine sage-grouse lek to be abandoned if this restriction were removed, causing significant impacts to the sage-grouse populations. Since the BLM expects that significant impacts would occur if the restriction was removed a FONSI could not be issued for this project. However, the BLM has reevaluated this Environmental Protection Measure (EPM). The EPM as written would preclude mining between the hours of 4:00am and 10:00am during the sage-grouse leking season (March 1-April 30). Based on the National Greater Sage-Grouse Conservation

Measures/Planning Strategy, the BLM determined that the EPM identified in the Pine Creek EA was above and beyond what is needed to protect the Elliot Mine lek. The BLM changed this EPM to mirror the guidance in the National Greater Sage-Grouse Conservation Measures/Planning Strategy which is "limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et. Al 2010, Blickley et al. in preparation)." BLM noise analysis shows that seasonal timing restrictions would only apply to Processing Site 3. Therefore, no seasonal restrictions would be placed on Processing Sites 1, 2, or 5 in Alternative 2.

Comment 11: Work with operators/owners of High Bar Mining LLC in order to create a long-term innovative mitigation and reclamation to significantly improve survival for these two [Greater sage-grouse and Columbia spotted frog] important Oregon sentinel species.

Response: BLM has developed a Habitat Management Plan that follows ORS 635-415-0000 and ODFW Mitigation Framework for Sage-Grouse to minimize habitat loss. The framework has specific mitigation recommendations for both direct and indirect effects. The BLM has a Memorandum of Understanding (MOU-BLM OR930-2001-2) with ODFW that promotes cooperative management and restoration of wildlife resources on public lands. Furthermore, the BLM has incorporated the EPM (found on page pg. 22) for Columbia spotted frogs and would be used if there was an impact to habitat.

Comment 12: Neither species [Greater sage-grouse or Columbia spotted frog] is protected by federal, state, or other law/regulation and the sage-grouse is doing well enough to have a hunting season.

Response: ***Greater sage-grouse-*** The State of Oregon has listed the sage-grouse under the Oregon Endangered Species Act (ORS 496.012; 138).
Columbia Spotted frogs- BLM has classified the Columbia spotted frog as a special status species under manual 6840 and is required to analyze impacts to habitat and direct impacts to individuals.

Comment 13: No citations or data were presented to indicate [wildlife] monitoring was being done in or around the project area.

Response: Results of wildlife surveys completed in the project area have been added to the EA. Reference to the surveyed data is on page 44 and survey forms are incorporated in Appendix C.

Comment 14: There was little in the document to support any of the proposed mining restrictions.

Response: All the mining restrictions are based on environmental protection measures (EPMs) which have reduced undue and unnecessary degradation in the past. The EPMs have been noted to eliminate significant impacts to the human environment. Therefore a Finding of No Significant Impact (FONSI) can be written and there is no need for an Environmental Impact Statement (EIS) to be written.

Comment 15: In regards to the Elliot Mine lek there is no indication of activity in the lek itself and no indication with maps or verbiage indicating the location of this lek in relation to the project site.

> *Response:* Based on this comment, the activity, description and location of the lek was added to the EA and this information can be found page 46 of the EA under the heading sage-grouse. The lek location is not public information and cannot be included on the maps of the project area.

Comment 16: There is no indication that any studies for noise or traffic flow have ever been conducted by BLM or any other agency within the vicinity of the proposed action.

> *Response:* No studies for noise or traffic have ever been conducted by BLM or any other agency in the vicinity of the proposed activities. However, the Oregon Sage-Grouse Mitigation Framework identified noise greater than 40 decibels (dBA) as having an effect on breeding activities and increased stress levels in sage-grouse (ODFW, 2012)

Comment 17: There is no substantiating evidence that mining processing sites will affect sage-grouse breeding by emitting high levels of ambient noise. Clarification needs to be made on what a processing site is in order to cite an appropriate reference.

> *Response:* The Oregon Sage-Grouse Mitigation framework identifies that noise greater than 40 decibels (dBA) as having an effect on breeding activities and increased stress levels in sage-grouse (ODFW, 2012). The studies used in the Mitigation Framework were not specific to mining but rather from oil and gas drilling operations and road noise.
>
> However, noise level from mining equipment is within the same range use in the study cited by ODFW. In addition, Blickley et. al. (2012) implies mining operation may have comparable effects on sage-grouse from increased noise levels. Therefore, the BLM believes that High Bar Group & Upper and Lower Pine Creek Mining operations would have the same effect on sage-grouse as identified by Blickley et. al. (2012)
>
> The BLM conducted an analysis, using decibel levels for equipment listed in the Plan of Operation, to help determine if mining noise would have an indirect impact to sage-grouse. The BLM used ODFW (2011) recommendations that noises above 40 decibels have an impact on sage-grouse. A Habitat Mitigation Plan was written and included in Appendix E of the EA. This plan indicates that only Processing Site 3, in the location it was proposed, would have seasonal restrictions for breeding during March 1-April 30 for one hour before sunset to two hours after sunrise.

Comment 18: The project is in a remote area and uses a few pieces of equipment which can be masked by distance or topography. There shouldn't be any detrimental effects to the sage-grouse from "constant flow of traffic".

Response: The BLM used Aylor (1977) to estimate sound attenuation which considers both vegetation cover and distance. A literature search conducted by BLM shows topography could either increase or decrease noise levels. However, from the literature search the BLM could not determine the effect topographical features would have for this project area. Therefore, topography was not used in determining noise attenuation. The BLM noise analysis shows that mining noise would have a direct effect on the Elliot Mine lek while Processing Site 3 is operating. Processing Sites 1, 2, 4, 5, and 6 are far enough away that expected noise from mining operations would be less than 40 decibels at the lek.

Comment 19: Citations in the wildlife section for effects to sage-grouse from noise have little direct relevance to the proposed action. Reasons for this conclusion include: 1) noise was played only within a few meters of active lek sites, 2) noise used in the referenced studies was associated with natural gas well-drilling rigs, aircraft over flights, or road traffic, 3) the speakers used to generate lek noise were of "small size", and especially, 4) although road-noise literature is extensively, significant scientific differences in interpretation remain.

Response: The BLM is using the best available science which shows noise levels above 40 dBA has a negative effect on the sage-grouse. The studies used in the High Bar Group & Upper and Lower Pine Creek Mining EA did not specifically relate to placer mining operations but rather from oil and gas drilling operations and road noise. However, noise level ranges used in the studies are similar to mining equipment used in placer operations. In addition, Blickley et. al. (2012) documents mining operations may have comparable effects on sage-grouse as oil and gas drilling or road traffic.

Comment 20: (sage-grouse) I strongly recommend that the mining activities be permitted on any day and at any hour since there is little published material or observational evidence to support a recommended shut-down period.

Response: The BLM has reevaluated the Environmental Protection Measure (EPM) to put a seasonal restriction on mining in sage-grouse habitat during the leking season. The EPM as written would preclude mining between the hours of 4:00am and 10:00am during the sage-grouse leking season (March 1-April 30). The BLM determined the protection measure may materially interfere with the operation violating (Public Law 167). The BLM changed this EPM to mirror the guidance in the National Greater Sage-Grouse Conservation Measures/Planning Strategy which is "limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et. Al 2010, Blickley et al. in preparation)." BLM noise analysis shows that seasonal timing restrictions would only apply to Processing Site 3. Therefore, no seasonal restrictions would be placed on Processing Sites 1, 2, or 5 in Alternative 2.

Comment 21: The EA doesn't come close to an acceptable analysis of the [Columbia spotted] frog situation.

Response: Based on this comment additional background information on Columbia spotted frog habitat was included in the EA (p. 46). Specifically, Pine Creek is an

important area for Columbia spotted frogs and their habitat. Pine Creek is the only known drainage that supports Columbia spotted frog populations within the Burnt River Valley. The next closest area with documented occurrence of frog activity within BLM lands is over 14 miles away in Mormon Basin.

Comment 22: Rescind EA restrictions for Columbia spotted frog for limitation of activities during March 1 to May 31 for egg laying/hatching and shelving at a 20-30 degree slope for habitat post mining.

Response: EPMs have been added to help mitigate impacts to Columbia spotted frog habitat by placing seasonal restrictions on in-stream work and designing ponds to improve breeding habitat. Specific EPMs created by the BLM for Columbia spotted frog can be found under section l. Environmental Protection Measures (p. 21) within the EA. Alternative 2 would have no effect on Columbia spotted frog due to limiting processing in the ponds and removing mining from the stream channel.

Comment 23: The proposed action should be approved.

Response: The proposed action as originally entered is lacking protection measures which would prevent undue and unnecessary degradation. Therefore, the action will be approved with protection measures and designs in order to issue a Finding of No Significant Impact (FONSI). There are some issues with the proposed action, mostly related to stream channel alteration, which would require further evaluation.

Oregon Department of Fish and Wildlife, 4/19/2013, Brian Ratliff, Baker District Wildlife Biologist:

Comment 24: ODFW in general prefers Alternative #2 with additional recommendations for Greater sage-grouse and winter range.

Response: The BLM's preferred alternative is Alternative #2 because of the additional protection measures. Your recommendations have been considered and many be incorporated into the habitat mitigation plan.

Comment 25: The EA never addresses the relative importance of the habitat within and adjacent to the project area, or the scale at which the projects impacts area expected to occur. This oversight leads ODFW to wonder if the BLM has failed to adequately analyze these impacts or if they were excluded from the EA.

Response: The EA will address the site specific importance of this area and how it is connected to the Baker sub-division (please see page 45 in the EA for clarification).

Comment 26: A sufficient mitigation plan for the project must be in place such that there is no net loss of habitat quantity or quality for the sage-grouse and the mule deer as well as provide a net benefit as defined in OAR 635-415-0005.

Response: A habitat mitigation plan has been completed and it follows the ODFW Mitigation Framework for Sage-Grouse Habitats (2012). By using ODFW's mitigation framework plan, the benefits defined under OAR 635-415-0000 are addressed. Mule deer should be covered by the mitigations put in place for the sage-grouse in the habitat mitigation plan.

Comment 27: ODFW highly recommends the seasonal restriction of eliminating noise producing activities that extend sound beyond the project boundary during the period of 1 March to 30 April from 1 hour after sunset to 2 hours after sunrise.

Response: The BLM evaluated ODFW's recommendation and determined that it may materially interfere with the operation violating Public Law 167. Therefore, the seasonal restriction will only be imposed on Processing Site #3 for noise levels.

High Bar Mining LLC, 4/19/2013, Phillip Wirth, manager:

Comment 28: Processing site #4 (Pack Rat Transfer) needs to be included into Alternative 2 for test runs and point of use in the water right. This area exists, hardened, and non-riparian.

Response: None of the Notices address the Pack Rat Transfer processing site (Processing Site #4), therefore it is not preexisting and also the reason it was not forwarded to Alternative 2. Alternative 2 was written to reduce work in the riparian areas for water quality and the protection of the Columbia spotted frog and frog habitat. Adding in Processing Site #4 as proposed, into Alternative 2 would not address the scope of Alternative 2. Since all the mining was also taken out of the valley bottom, there would be no need for a processing site other than Processing Site #5 which exists under a Notice.

Comment 29: EA is incorrect in places, there will be up to 15 acres mined annually, this error needs to be corrected.

Response: All references have been changed in the document to reflect the accurate acreage.

Comment 30: There is only one processing pond at Processing Site #1.

Response: On page 5 of the High Bar Plan of Operation (OR-63719), it describes that 2 off-channel ponds are currently being used at processing site #1, and that those ponds will be replaced by 3 ponds approx. 40' x 200' x 8', if that is a misinterpretation it is to the operator's benefit. If there was a greater disturbance evaluated than listed in the initial Plan of Operation, then a smaller disturbance is already covered by analysis. However if a modification needs to be made, it can be dealt with administratively.

Comment 31: The source of water in the spring in Brannon Gulch is from (not for) the mining process ponds that previously were unlined, and now have been reclaimed.

Response: The initial evaluation by Tim Bliss was that these springs exist and that they would need to be monitored to determine why they are there and if the mining would have an effect on them in the long term. Further information regarding springs and wetlands is on page 60 of the EA.

Comment 32: Fencing of all reclaimed areas is not proposed or reasonable. High Bar is confident that revegetation to satisfactory standards can be accomplished without fencing.

Response: Fencing of reclaimed areas has been taken out of Alternative 1 in the final EA for the proposed action since it was not originally included in the Plans. However, in order to reestablish sufficient vegetative cover, range management would add temporary fencing of reclaimed areas for 3 years or totaling 50 acres to the environmental protection measures. Exclusion/restrictions of livestock grazing for 3-5 growing periods on rehabilitation sites is also included in the Baker Resource Area Resource Management Plan (1989, page 110)

Comment 33: Limitations on work during March 1-May 31 in riparian areas is not reasonable, and would materially interfere with our business. Riparian areas and habitat haven't been defined enough to identify what areas would need to be avoided for Columbia spotted frog.

Response: A survey has been conducted by the BLM biologist that identified habitat throughout the Pine Creek channel that would support habitat for Columbia spotted frog life history needs. The survey was conducted in June and there was still enough water within the channel that frog activity was observed. The survey started at the most northern boundary of BLM lands and followed the channel until reaching the southern boundary of BLM lands. There are several ponds throughout the channel that would also support frog habitat throughout the summer months. A copy of the survey can be found at Appendix C.

Comment 34: By limiting mining for noise purposes during the hours between 4am and 10am for the period of March 1 to April 31 would materially interfere with the business and is not reasonable.

Response: The BLM has reevaluated the Environmental Protection Measure (EPM) related to noise levels during leking. The EPM as written would preclude mining between the hours of 4:00am and 10:00am during the sage-grouse leking season (March 1-April 30). Based on the National Greater Sage-Grouse Conservation Measures/Planning Strategy, the BLM determined that the EPM identified in the Pine Creek EA was above and beyond what is needed to protect the Elliot Mine lek. The BLM changed this EPM to mirror the guidance in the National Greater Sage-Grouse Conservation Measures/Planning Strategy which is "limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et. Al 2010, Blickley et al. in preparation)." BLM noise analysis shows that seasonal timing restrictions would only apply to Processing Site 3. Therefore, no seasonal restrictions would be placed on Processing Sites 1, 2, or 5 in Alternative 2.

Comment 35: Company believes that there was a previously agreed to mitigation plan with Brian Ratliff of ODFW, Gary Miller of USFWS, and Marissa Myers of USFWS which includes: a 1:1 plus off site juniper cutting, can be on public or private land, and within 5 years of the 20 year project.

> *Response:* Under the Mitigation Framework for Sage-Grouse Habitat direct impacts to sage-grouse habitat would be mitigated at a ratio of 1:1 and was agreed upon between BLM and the proponent on January 30th 2012. At the time of the meeting the noise analysis was not completed therefore an adequate mitigation was not known and no agreements were made. Subsequent to the meeting with the proponent, the BLM conducted a noise analysis and found that 45 additional acres are needed to mitigate indirect impacts. The total offsite mitigation would be 241 acres of juniper cutting, see Appendix E: Habitat Mitigation Plan.

Comment 36: We are committed to doing everything reasonable to protect the birds; however the birds are neither threatened nor endangered, we are not mining in core habitat, nor are we mining near a lek. No other miners, loggers, ranchers and/or public users in our area, that we are aware of, are subject to time restrictions for their activities.

> *Response:* Other user groups have had restrictions when activities occur in sage-grouse habitat. Specifically livestock permittees are not authorized to trail livestock through a lek during the leking season (March 1-April 30) and the placement of salt/supplement is not authorized in close proximity of a lek. Sage-grouse restrictions do not apply to loggers since timber harvesting does not occur in sage-grouse habitat. The mining operation referenced is not in sage-grouse habitat; therefore the restrictions on activities would not apply.

United States Fish and Wildlife Service, 4/22/2013, Gary S. Miller, La Grande Field Supervisor:

Comment 37: Effects from the Project are likely to include conversion and further fragmentation of sage-grouse habitat.

> *Response:* BLM has acknowledged that sage-grouse habitat fragmentation would increase within the immediate vicinity of the project area. However the BLM expects that fragmentation would only occur for 15 to 25 years, which is the amount of time needed for reclamation to advance to pre-disturbance structure and function (Bunting et al 1987). In addition, the BLM requires the proponent to enhance 241 acres of juniper encroachment, in close proximity to the project area, to offset temporary habitat loss/fragmentation caused by mining.

Comment 38: It is unclear from the information in the EA as to whether impacts were analyzed. A discussion of the anticipated impacts to sage-grouse at a landscape/population scale (Baker population) and how the Baker population relates to other sage-grouse populations is lacking in the EA.

> *Response:* The EA will address the importance of the Elliot Mine lek and how it is connected to the Baker sub-division. A discussion on how the project area is connected to the baker sub-division can be found on page 45 of the EA.

Comment 39: The Conservations Objectives Report [COR] (USFWS, 2013) describes impacts from mining within sage-grouse habitats to include the direct loss of habitat, habitat fragmentation, and indirect impacts from disturbance (e.g. noise, dust). Conservation options are provided in the report, two apply to locatable mining.

> *Response:* The COR objectives specific to this project area were used to develop alternatives that addresses the needs to keep the sage-grouse from being listed. Along with the COR, the BLM used the BLM NTT report to address the habitat needs for sage-grouse within this EA which include reclamation (pg 15), seasonal restrictions (pg 22), and dust control (pg 18).

Comment 40: USFWS recommend BLM implements Alternative 2 with additional mitigations for sage-grouse, eagles and raptors, and Columbia spotted frog (see pages 3 and 4 of comments).

> *Response:* A survey was completed within 2 miles of the project area and no eagles or raptors were observed, therefore, additional mitigation is not warranted for these species. Alternative 2 would not authorize mining in Columbia spotted frog habitat therefore no additional mitigations are warranted for Columbia spotted frogs. Additional mitigations recommended for sage-grouse were incorporated into the EA in Appendix E: Habitat Mitigation Plan.

Comment 41: It is unclear from the information in the EA as to whether the Project area (plus 2 miles) was surveyed for eagle or other raptor nests.

> *Response:* The EA was updated to incorporate the wildlife survey that was done for the area. No nests for eagles where noted in the survey. Please see Appendix C for wildlife surveys.

Comment 42: In selecting management actions [for mitigations], the Service provides the following as examples of allowable mitigation. (see #1-7 on pages 6 and 7 of comments)

> *Response:* The BLM has developed a strategy what would be used as allowable mitigation actions. The BLM has taken into your considerations 3, 4, 5b, and 6 listed on page 6 of your letter, when developing mitigation for the project area (See Habitat Mitigation Plan, Appendix E of the EA).

Oregon Department of State Lands (DSL), 4/18/2013, Heidi Hartman, Resource Coordinator:

Comment 43: When more than 50 cubic yards of removal/fill occurs in streams, lakes, estuaries, and wetlands, the operator will need to file for a permit.

> *Response:* In 43 CFR 3809.3, the operator is required to follow all state laws and regulations regarding any permitting in addition to BLMs regulations on BLM managed lands. Therefore, if the operator is required to have a permit for removal/fill, they would be responsible for applying for that permit.