

THE BUFFALO HUMP MINING DISTRICT

AKA: ROBBINS MINING DISTRICT

AKA: Vesuvius Mine, Alhambra Mine, Spokane Mine, Tiger Prospect, Altoona Mine, Big Buffalo Mine, Cracker Jack Mine (aka Cracker Jack Mill), Winslow Prospect, Wiseboy Mine, North Star Mine, Lucky Lad Mine, Mother Lode Mine (aka Concord), Ajax Mine, Atlas Mine and Mill, Rob Roy Mine (aka Dice Mine), St. Louis Mine, Jumbo Mine and Mill (aka Brooklyn Mill) and Jumbo Camp, Del Rio Mine and Mill (aka Venture), Dewey Occurrence, Sheep Creek Placers, and miscellaneous patented mine and mill site claims

PRELIMINARY ASSESSMENT AND SITE INSPECTION REPORT

Idaho County
State of Idaho



Department of Environmental Quality

February 2011

Submitted to:
U. S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

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February 7, 2011

Mr. Ken Marcy
U.S. Environmental Protection Agency
Region 10
12928 SW 276th Street
Vashon, WA 98070

Subject: Preliminary Assessment and Site Investigation (PA/SI) Report for the Buffalo Hump Mining District aka Robbins Mining District:

aka: Vesuvius Mine, Alhambra Mine, Spokane Mine, Tiger Prospect, Altoona Mine, Big Buffalo Mine, Cracker Jack Mine (aka Cracker Jack Mill), Winslow Prospect, Wiseboy Mine, North Star Mine, Lucky Lad Mine, Mother Lode Mine (aka Concord), Ajax Mine, Atlas Mine and Mill, Rob Roy Mine (aka Dice Mine), St. Louis Mine, Jumbo Mine and Mill (aka Brooklyn Mill) and Jumbo Camp, Del Rio Mine and Mill (aka Venture), Dewey Occurrence, Sheep Creek Placers, and miscellaneous patented mine and mill site claims

Dear Mr. Marcy:

The Idaho Department of Environmental Quality (DEQ) is very pleased to submit this Preliminary Assessment and Site Inspection report. This project is the result of a combination of site specific and watershed assessment techniques. Although DEQ had access granted to numerous private properties, DEQ had to employ a watershed approach to evaluate cumulative historic impacts of mining activities in multiple watersheds. Specific details regarding ownership, property/mine locations, environmental data, history and geology are contained in the report. However, below is a brief description of the project area and DEQ's recommendations regarding these properties.

BACKGROUND

The Buffalo Hump Mining District is located on patented mine and mill site claims and unpatented mining claims on federal lands administered by the United States Forest Service (USFS). The Buffalo Hump Mining District contains numerous mine and mill sites. DEQ visited 20 mines and mill sites and numerous miscellaneous mine sites and claims.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

Toxicological risks to human and ecological receptors are very unlikely in the Buffalo Hump Mining District. This is due to the remoteness, infrequent use of the area, and restricted access. The exception would be if historic mines are reopened or homes are built directly on mine waste dumps. In that case, site workers and full time residents may be at risk for toxic exposures. However, mine site safety and health plans and proper residential planning should adequately manage these risks.

DEQ is recommending EPA classify each of the 20 mine and mill sites and prospects evaluated as No Remedial Action Planned (NRAP). It should, however, be noted by private property owners, developers, and visitors this recommendation does not consider indirect risks associated with physical hazards. Furthermore, DEQ strongly recommends all domestic drinking water supplies are routinely tested by their owners.

Besides making observations and collecting data from properties where DEQ had legal access, DEQ used numerous observations and information contained in Ted Erdman's and John Kauffman's *"Site Inspection Reports for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands Region 1 Nez Perce National Forest"* (Idaho Geological Survey 2001) to discuss site conditions at mines and on private properties where IDEQ was not granted access.

For the purposes of evaluating all properties contained in the Buffalo Hump Mining District, it was necessary to attempt an arbitrary "lumping" or grouping of mine claim patents around the historic mine workings they may have supported or contained. There was no intent to draw any conclusions regarding liabilities of any patent owner or group of patent owners for the conditions of historic workings with which their properties have been grouped.

Furthermore, it is important to restate no samples or data were collected on private properties where access was not explicitly provided to DEQ, even though observations about properties and cumulative effects within the watershed were made as a result of access to public roads and private properties DEQ did have access to.

SPECIFIC MINE RECOMMENDATIONS

Vesuvius Mine

The Vesuvius Mine and numerous patented claims surrounding the mine are owned by Mr. Steve Evans of Madison, Wisconsin. Although there are numerous signs of trespass at the Vesuvius Mine by recreational users, DEQ did not have legal access to the site. Therefore, only qualitative observations were made about the site from the public road that passes close to the workings.

The most significant risks noted were those relative to the shaft collar, access to which was partially restricted by a fence. There were no apparent significant volumes of mine wastes or heavy metals present. DEQ did not collect any soil or water samples. However, assuming the

geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Vesuvius Mine be designated as NRAP.

Alhambra Mine

The Alhambra Mine and surrounding patented claims are owned by numerous parties and are interspersed with public lands administered by the Nez Perce National Forest. DEQ did not have access to the Alhambra Mine and did not enter the property. However, Erdman and Kauffman of the Idaho Geological Survey (IGS) apparently did visit the site in 2000.

There were no water or waste samples collected. Based on limited observations made by previous inspectors and assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, DEQ is recommending the Alhambra Mine be designated as NRAP.

Spokane Mine

The Spokane Mine is wholly on public lands administered by the Nez Perce National Forest. DEQ did not visit the Spokane Mine because it did not receive legal access to the property.

The IGS apparently did visit the site where they observed waste rock dumps containing less than 300 cubic yards. No water or waste samples were collected. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely that significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Spokane Mine be designated as NRAP.

Tiger Prospect

The Tiger Prospect is wholly on public lands administered by the Nez Perce National Forest. DEQ did not visit the Tiger Prospect because it did not receive legal access to the property.

The IGS apparently did visit the site in 2000. The waste rock dump described by IGS contains less than 200 cubic yards and was not sampled. No water or waste samples were collected. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Tiger Prospect be designated as NRAP.

Altoona Mine

The Altoona Mine is on public lands administered by the Nez Perce National Forest. DEQ did not visit the Altoona Mine because it did not receive legal access to the property. The IGS apparently did visit the site in 2000.

The waste rock dump described by IGS contains less than 200 cubic yards and was not sampled. No water or waste samples were collected. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Altoona Mine be designated as a NRAP.

Big Buffalo Mine

The Big Buffalo Mine and surrounding patented claims are owned separately by numerous private individuals or families. The mine and claims were lumped together for this assessment. During the July 2010 period when DEQ was conducting field exams for site assessments, DEQ did not have legal access to the Big Buffalo Mine. DEQ did have access to several nearby patented claims. However, in September 2010 the property owners of the Big Buffalo Mine provided access to the Idaho Department of Lands (IDL) and DEQ to inspect the property prior to the writing, submittal, and agency approval of a reclamation plan for development of a surface mine at the Big Buffalo.

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. If the mine reopens, mine workers at the Big Buffalo Mine are likely to receive exposures via air and soil pathways. Although this is an inherent risk of the job, a mine site safety and health plan required by the Mine Safety and Health Administration (MSHA) should account for management of these risks. Based on the limited observations and assumptions made regarding the site DEQ is recommending the Big Buffalo Mine be designated as NRAP.

Cracker Jack Mine (aka Cracker Jack Mill)

The Cracker Jack Mine is owned by numerous private individuals. DEQ did not receive legal access to visit the Cracker Jack Mine.

However, DEQ was able to make qualitative observations of the mine from an overlook on the "Devils Staircase." DEQ was able to see very little remains of historical adits and waste dumps at the Cracker Jack Mine on the canyon walls. DEQ also used water quality data collected below the Calendar town site to assess the cumulative effects of mine and mill sites, particularly the Vesuvius Mine, Cracker Jack Mine, and Winslow Prospect, on Lake Creek (upper), and determine if any significant human health or ecological risks existed. DEQ did not collect any

soil or water samples at the mine site. Based on limited data, and assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, DEQ is recommending the Cracker Jack Mine be designated as NRAP.

Winslow Prospect

The Winslow Prospect is owned by numerous private individuals. DEQ did receive legal access from some of the owners.

The Winslow Prospect has one collapsed adit on the property. DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Winslow Project be designated as NRAP.

Wiseboy Mine and Mill (aka American, Tennessee, Rob Roy Extension, Wise Boy, and North Star claims)

The Wiseboy Mine and Mill are located on numerous patented claims owned by several private individuals and on public lands administered by the Nez Perce National Forest. Several patented claim owners provided DEQ with legal access to the property.

The Wiseboy Mine was likely located by the staking of the American, Rob Roy Extension, Wise Boy, and Tennessee patented claims, and the North Star unpatented claim. Although mapped and named separately, it is likely the North Star Mine is actually the adit for the lower level of the Wiseboy Mine. The Wiseboy Mill was never operated and there is no evidence of hazardous or otherwise deleterious materials at the mill site which since its construction has burned down. DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Based on these observations and assumptions made regarding the site, DEQ is recommending the Wiseboy Mine and Mill be designated as NRAP.

North Star Mine (aka North Star claim)

The North Star Mine is located on numerous patented claims owned by several private individuals and on public lands administered by the Nez Perce National Forest. Several patented claim owners provided DEQ with legal access to the property.

DEQ assessed the North Star Mine. DEQ did not collect any soil or water samples. However, assuming that the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site.

Based on these observations and assumptions made regarding the site, DEQ is recommending the North Star Mine be designated as NRAP.

Lucky Lad Mine

The Lucky Lad Mine is located on patented claims owned by several private individuals. Although DEQ did not have legal access to the mine, DEQ passed through the claims and made observations exclusively from the trail used by backpackers and hunters. DEQ observed a collapsed adit, collapsed shaft, two collapsed buildings and a small (<1,000 cubic yards) waste dump. There did not appear to be any mine drainage or connection between the waste dump and Hump Lake to the south. DEQ did not collect any soil or water samples. However, assuming that the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Based on these observations and assumptions made regarding the site, DEQ is recommending the Lucky Lad Mine be designated as NRAP.

Mother Lode Mine (aka Concord Mine, Mother Lode Group, and Concord Town Site)

The Mother Lode Mine and numerous patented claims surrounding the mine are owned by Mr. Gary Showalter of Vancouver, Washington. Mr. Showalter provided DEQ with legal access to all of his private lands. The Mother Lode Mine is surrounded by a number of patented mining claims each of which has a different level of mine and ancillary facilities development on them. These include mineral prospects, shafts, tunnels, collapsed buildings and sheds, the remnants of the town of Concord, and an airstrip. Patented mining claims thought to be closely associated with the Mother Lode Mine include the Concord, Mother Lode, Mother Lode No. 2, Mother Lode Fraction, Shelby, Shelby Fraction, Phoenix Group, and Idaho Girl Group.

Although there are minor amounts of petroleum contaminated soils and large volumes of solid wastes located around the Mother Lode shaft, they are relatively insignificant. It is unlikely significant human health or ecological risks exist at this site. Based on these observations and assumptions made regarding the site, DEQ is recommending the Mother Lode Mine be designated as NRAP.

Ajax Mine

The Ajax Mine is mixed ownership lands. The private land is owned by Mr. Gary Showalter who provided DEQ with legal access and public lands administered by the Nez Perce National Forest.

The Ajax Mine contains an open shaft and a multi-lobed waste dump that contains less than 1,000 cubic yards of mostly biotite granodiorite country rock. Surrounding claims have numerous exploration pits and trenches on them. DEQ did not collect any soil or water samples. However, assuming that the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at

this site. Based on these observations and assumptions made regarding the site, DEQ is recommending the Ajax Mine be designated as NRAP.

Atlas Mine and Mill

The Atlas Mine and Mill site(s) are located on private lands owned by a number of private individuals. Although DEQ did not have legal access to assess the Atlas Mine and Mill, DEQ made several observations about the mine and mill site traversing the area to find the claim corners for properties to which access was granted. The Atlas Mine is surrounded by a number of patented claims DEQ presumes may have been located to explore and develop the mine and associated veins. These include the General Armstrong, CBDK, Fortune, Monterey, Monterey Fraction, and Baltic patented claims.

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Based on these observations and assumptions made regarding the site DEQ is recommending the Atlas Mine and Mill site be designated as NRAP.

Rob Roy Mine (aka Dice Mine)

There is some confusion in the historical descriptions of the location for the Rob Roy Mine. However, according to the IGS, the Rob Roy is actually located on lands administered by the Nez Perce National Forest. DEQ did not have legal access to the mine site; therefore, we did not visit the Rob Roy Mine. The site was visited by IGS in 2000.

Apparently the Rob Roy Mine has one collapsed adit and a very small (<100 cubic yards) waste dump. Although there is a minor seep from the collapsed adit, IGS did not collect or analyze water or waste samples. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Rob Roy Mine be designated as NRAP.

St. Louis Mine

The St. Louis Mine is located on patented lands owned by John and James Zehner. The Zehners provided DEQ with legal access to assess the mine.

The St. Louis Mine has several open adits, shafts, and raises that seem to connect to one lower level. Approximately two gallons per minute of water is flowing from the lower adit. The waste dump at this level contains less than 500 cubic yards of waste that does not seem to contain much in the way of sulfides. There is evidence of a small grizzly and jig set up, where screens and less than 5 cubic yards of jig tailings remain.

The open adits, tunnels and stopes at the St. Louis Mine present very dangerous physical hazards and should be closed or fenced. Water quality field parameters measured at the site and laboratory analysis were unremarkable. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the St. Louis Mine be designated as NRAP.

Jumbo Mine and Mill (aka Brooklyn Mill and Jumbo Camp)

The Jumbo Mine and Mill sites are located on mixed ownership lands owned by private individuals or administered by the Nez Perce National Forest. DEQ did not have legal access and did not fully explore the entire Jumbo Mine and Mill sites. However, IGS did visit the site in 2000.

IGS pulled and analyzed numerous samples of mill tailings and mine effluent. The analytical information provided to IGS does not indicate any serious ecological or human health risks. Structures at the Jumbo Mine and Mill burned down including a collapsed tramway and wheel house just below Jumbo Camp. Based on the limited observations and assumptions made regarding these sites, DEQ is recommending the Jumbo Mine and Mill be designated as NRAP.

Del Rio Mine and Mill (aka Venture Mine)

The Del Rio Mine and Mill are located on lands administered by the Nez Perce National Forest. Because these sites were completely on federal lands DEQ did not inspect them. However, IGS did visit the site in 2000.

IGS collected and analyzed samples of mill tailings and mine effluent. The analytical information provided to IGS does not indicate any serious ecological or human health risks. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Del Rio Mine and Mill be designated as NRAP.

Dewey Occurrence

The Dewey Occurrence consists of patented mining claims that have been subdivided into numerous parcels owned by a number of separate individuals. The Dewey Occurrence has many recreational homes and cabins located along the USFS road that traverses the Buffalo Hump Mining District. DEQ did not have access to these properties. However, from the public road DEQ did observe the only (minor) mine development on the property.

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Dewey Occurrence be designated as NRAP.

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Sheep Creek Placers

The Sheep Creek Placers is a very large block of patented placer ground approximately 140 acres in size. The patents are owned by a number of private individuals.

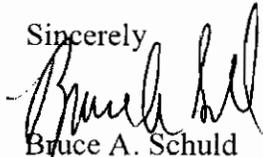
DEQ collected soil and water samples on lands below the placer claims. The site where samples were collected is on land administered by the Nez Perce National Forest. The samples were used to evaluate the cumulative effects of mining on Sheep Creek. Based on this data and assumptions the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, DEQ is recommending the Sheep Creek Placers be designated as NRAP.

CONCLUSION

Mining districts and watersheds like the Buffalo Hump area are extremely complicated to assess. Property ownership and boundaries are nearly impossible to accurately describe in PA/SI reports. Fortunately, both site specific data and watershed analyses do not indicate any significant human health or ecological impacts from historic mining in the Buffalo Hump Mining District.

If you have any questions or concerns regarding this report, please call me.

Sincerely



Bruce A. Schuld
Mine Waste Projects Coordinator

attachment

cc: Marty Jones, USDA Nez Perce National Forest, 104 Airport Road, Grangeville, ID 83530
Buffalo Hump Mining District File(s)

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List of Acronyms

4WD	four wheel drive
amsl	above mean sea level
bgs	below ground surface
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
gpm	gallons per minute
HHSLs	Human Health Medium-Specific Screening Levels
HRS	Hazard Ranking Score
IDL	Idaho Department of Lands
IDTLs	Initial Default Target Levels
IGS	Idaho Geological Survey
MCL	Maximum Concentration Limit
MSHA	Mine Safety and Health Administration
NAIP	National Agriculture Imagery Program
NPDES	National Pollution Discharge Elimination System
NRAP	No Remedial Action Planned
OCA	Other Cleanup Action
ORV	off road vehicle

PA	Preliminary Assessment
PPE	probable point of entry
ppm, mg/kg, mg/L	parts per million, milligrams per kilograms, milligrams per Liter
RCRA	Resource Conservation Recovery Act
RMP	Risk Management Plan
SI	Site Inspection
SQAP	Sampling and Quality Assurance Plan
SVL	Silver Valley Laboratories, Inc.
TAL	Target Analyte List
TDL	Target Distance Limit
TMDL	Total Maximum Daily Load
USFS	United States Forest Service
USGS	U.S. Geological Survey
VCP	Voluntary Cleanup Program

Section 1. Introduction

This report presents the results of the Preliminary Assessment and Site Inspection (PA/SI) for mine and mill sites located in the Buffalo Hump Mining District. The Idaho Department of Environmental Quality (DEQ) is contracted by Region 10 of the United States Environmental Protection Agency (EPA) to provide technical support for completion of preliminary assessments at various mines on private or state lands and/or those areas that have mixed ownership (public and private).

DEQ also completes site assessments to respond to complaints or information about sites possibly contaminated with hazardous waste. These sites include abandoned mines, rural airfields that have served as bases for aerial spraying, old landfills, illegal dumps, and abandoned industrial facilities with known or suspected releases.

In February 2002, DEQ initiated a Preliminary Assessment Program to evaluate and prioritize assessment of potentially contaminated sites. Due to accessibility and funding considerations, priority is given to sites where potential contamination poses the most likely threat to human health or the environment. In recent years this priority has focused DEQ's efforts in areas where residential and recreational developments are encroaching on historic mining districts. Priority is also given to mining districts where groups or clusters of sites like those found in the Buffalo Hump Mining District can be cost effectively assessed on a watershed basis.

For additional information about the Preliminary Assessment Program, see the following:

http://www.deq.idaho.gov/waste/prog_issues/mining/pa_program.cfm

The Buffalo Hump Mining District is located around patented and unpatented mining claims on federal lands administered by the United States Forest Service (USFS) (Figure 1).

The Buffalo Hump Mining District contains numerous mine and mill sites. In July 2010, DEQ visited 20 mine and mill sites and numerous miscellaneous mine sites and claims. In September, DEQ revisited the Big Buffalo Mine in coordination with the IDL Mine Reclamation Plan application. DEQ also utilized extensive reports compiled by the Idaho Geological Survey (IGS) which discussed these sites and others for which DEQ did not have legal access for site visits.

Numerous sources were used during the "desktop" research prior to visiting the site. Most notably are the articles on the history and geology of the Buffalo Hump Mining District written by P.J. Shenon and J.C. Reed (1932) "*Geology and Ore deposits of the Elk City, Orogrande, Buffalo Hump, and Ten Mile Districts, Idaho*" and Ted Erdman and John Kauffman (2001) "*Site Inspection Reports for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands Region 1 Nez Perce National Forest.*" DEQ could not improve or expound upon these reports by writing additional historical or geological text, therefore they were directly referenced and cited in this report.

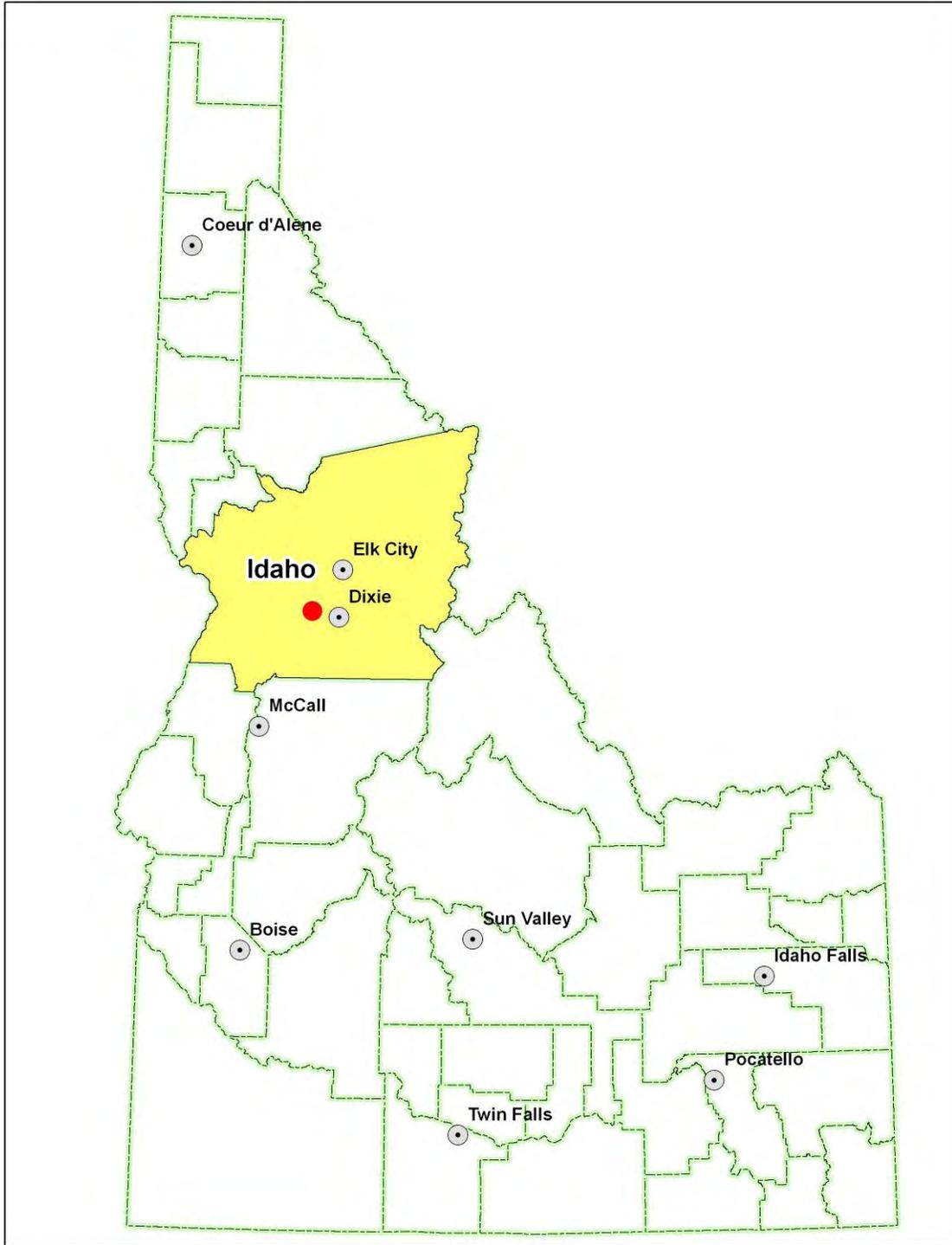


Figure 1. Location of the Buffalo Hump Mining District (red dot) in Idaho County, Idaho

DEQ visited the Buffalo Hump Mining District during the week of July 26–29, 2010. DEQ would like to thank George and Sue Lavalley, John and James Zehner, William and Laura Niemela, Larry Allen, Diana Sanman, Everett D. Sneed, Gary and Kathleen Showalter, and Steve Evans for granting DEQ access. In addition, USFS property containing historic mine and mill facilities were accessed. DEQ did not purposely or knowingly trespass on any private holdings.

In spite of the lack of response from other property owners, DEQ was able to make sufficient observations about co-owned claims to come to many of the conclusions presented in this report.

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Section 2. Ownership

DEQ does not warrant the ownership research or location of property boundaries contained in this report. The information regarding ownership and property boundaries was obtained from several sources including the Idaho County Assessor's Office and the U.S. Department of Interior – Bureau of Land Management (BLM) General Land Office (GLO) Records.

DEQ also has used references from several different documents including USGS maps, county tax rolls, and historical reports that spell claim names, town sites, and/or geographic features differently from one another. DEQ's use of the different spellings is to remain in context with the reference used for each given section of text or written in this report.

Figure 2 is a topographical map of the area. Figure 3 is an aerial photo overlain by approximate claim boundaries of assessed properties in the Buffalo Hump Mining District. Figures 4 through 6 show the approximate claim boundaries and names of assessed properties in the Buffalo Hump Mining District.

In the ownership table (Table 1) the terminology “**Partial Determination**” is meant to convey a very brief summary of DEQ's assessment of individual claims and parcels relative to human health and ecological risk factors associated with toxicological responses to mine wastes. A determination of No Remedial Action Planned or “**NRAP**” means based on current conditions at the site, DEQ did not find any significant evidence indicating the potential of adverse toxicological effects to human or ecological receptors on the parcel of land. This determination says nothing about risks associated with physical hazards such as open adits, open shafts, high walls, or unstable ground. The Partial Determination of “**Calculate HRS**” indicates DEQ has determined there is sufficient evidence of a release of hazardous substances, complete pathways, and likely exposure of sensitive receptors. Therefore, the site conditions warrant calculation of a “**Hazard Ranking Score**” (HRS) by EPA's contractors. This designation also indicates DEQ has made significant conclusions and recommendations that additional site assessment and/or remedial actions are necessary to prevent adverse effects to human or ecological receptors. These conclusions and recommendations are contained in Section 11 of this report. DEQ did not find any sites requiring the Partial Determination of Calculate HRS in the Buffalo Hump Mining District.

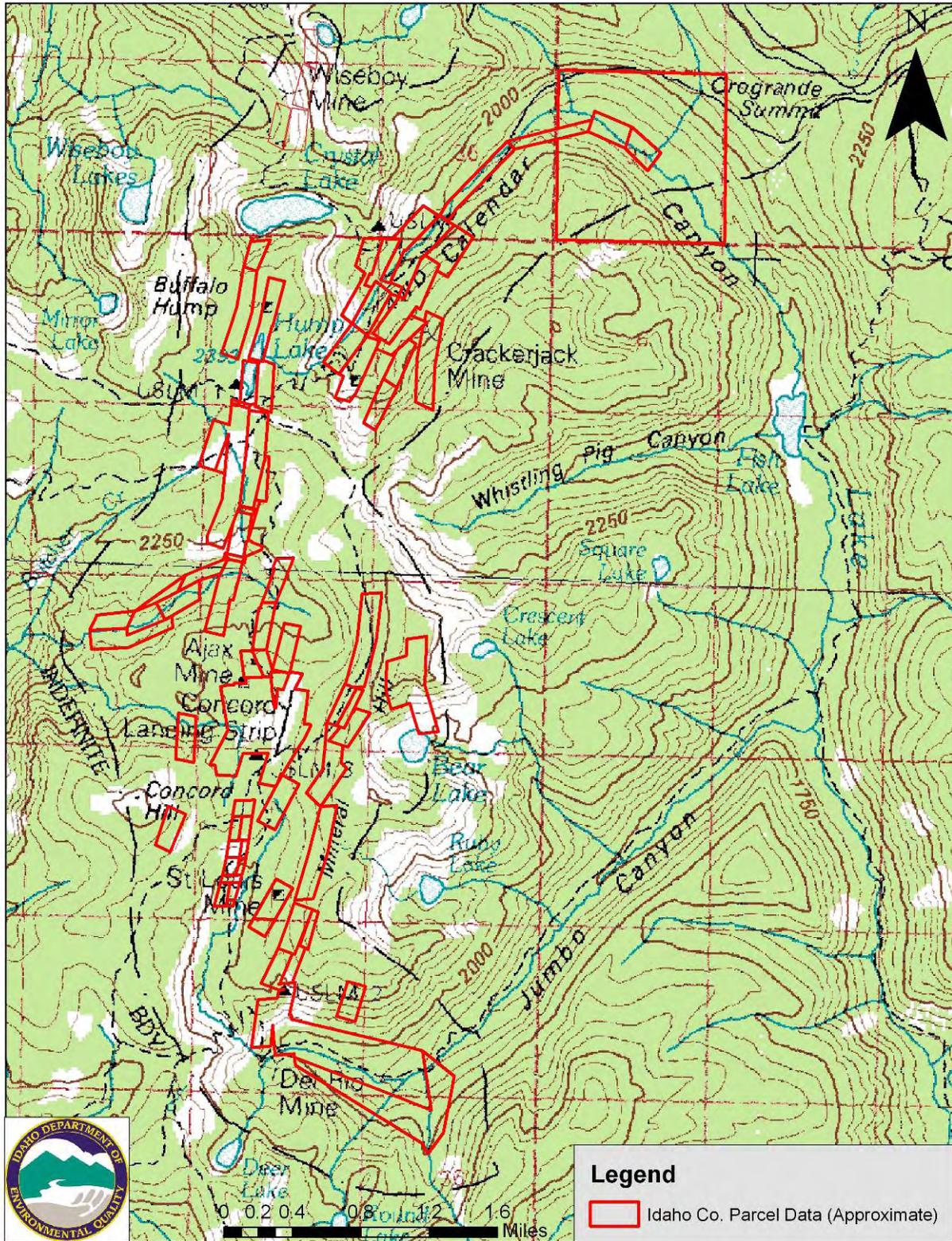


Figure 2. Topographical Location Map of the Buffalo Hump Mining District with Idaho County 2010 Parcel Data Overlay (Map Source: USGS 24k)

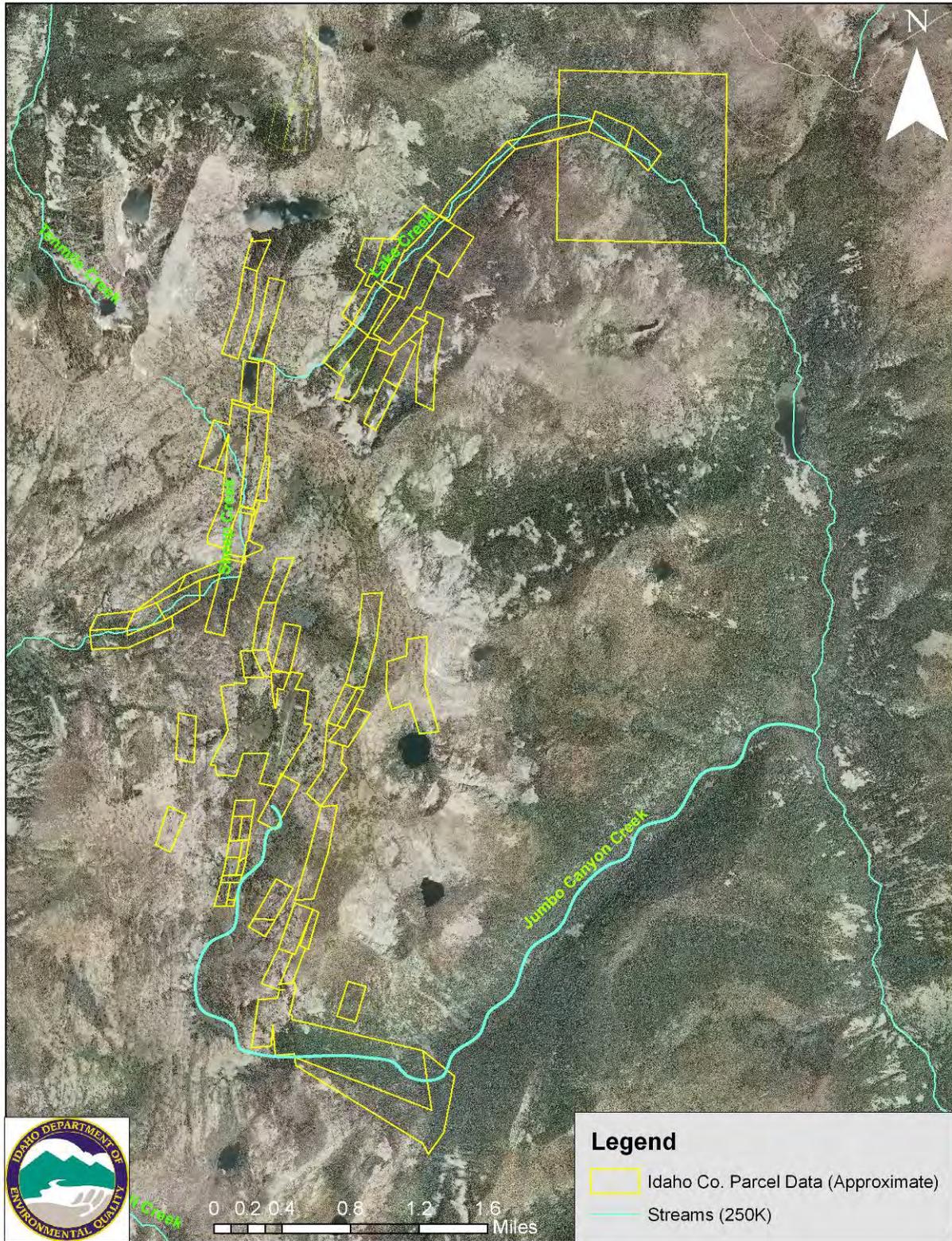


Figure 3. Aerial Location Map of the Buffalo Hump Mining District with Idaho County 2010 Parcel Data Overlay (Map Source: 2004 National Agriculture Imagery Program (NAIP))

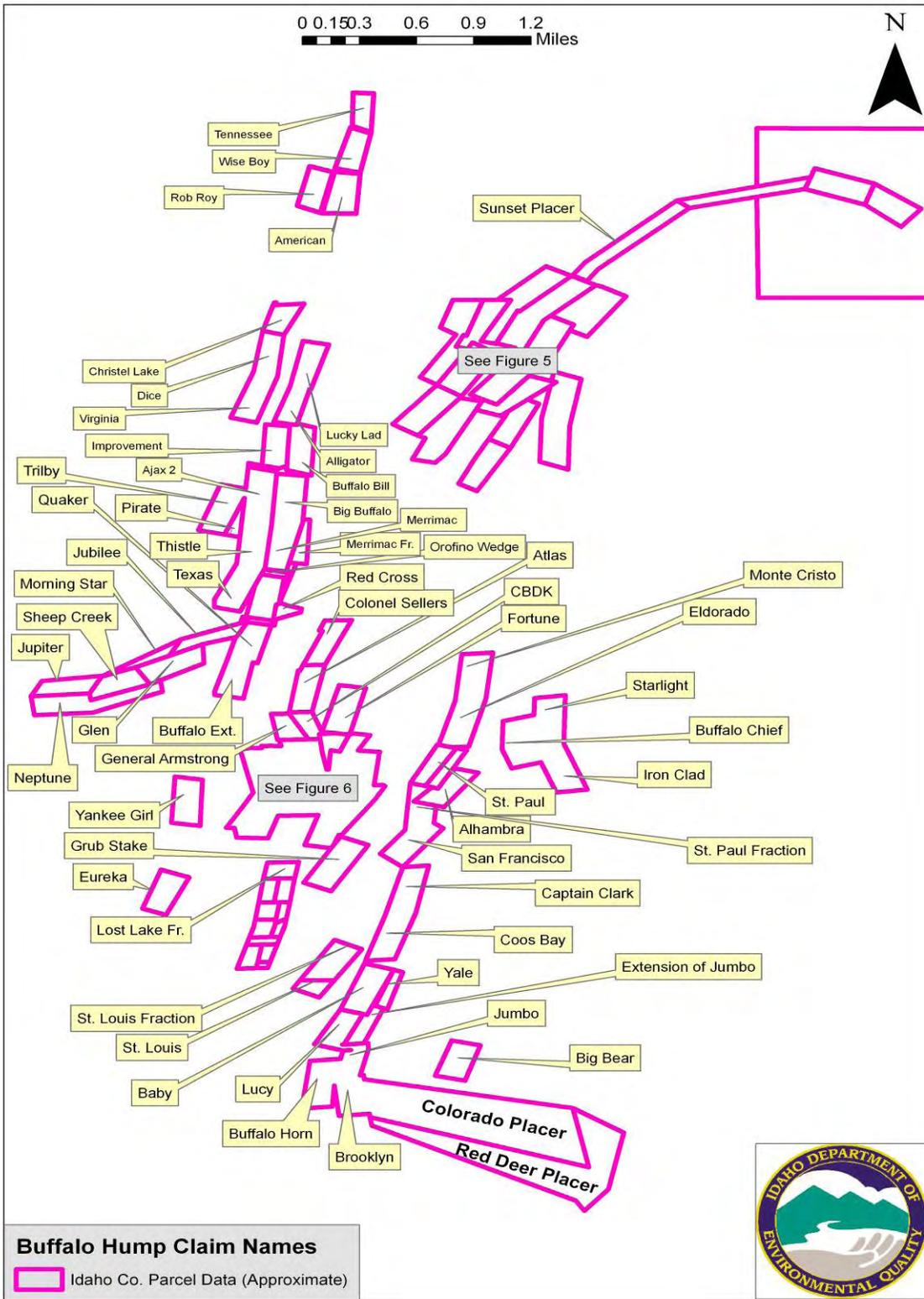


Figure 4. Idaho County Parcel Map with Claim Names (Idaho DEQ GIS ArcSDE 9.2 Geodatabase)

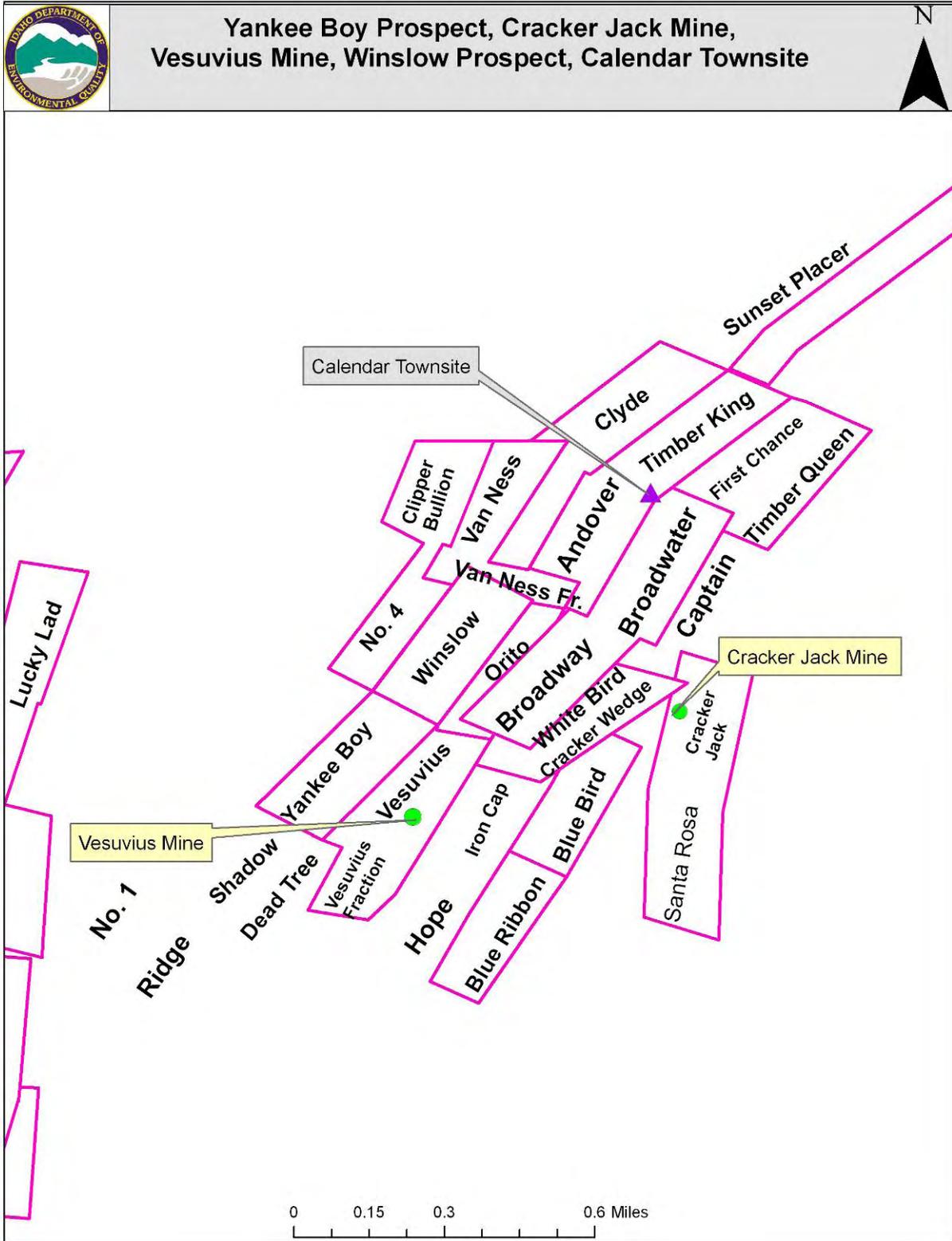


Figure 5. Idaho County Parcel Map with Claim Names: Calendar Town Site, Cracker Jack Mine, and Vesuvius Mine (Idaho DEQ GIS ArcSDE 9.2 Geodatabase)

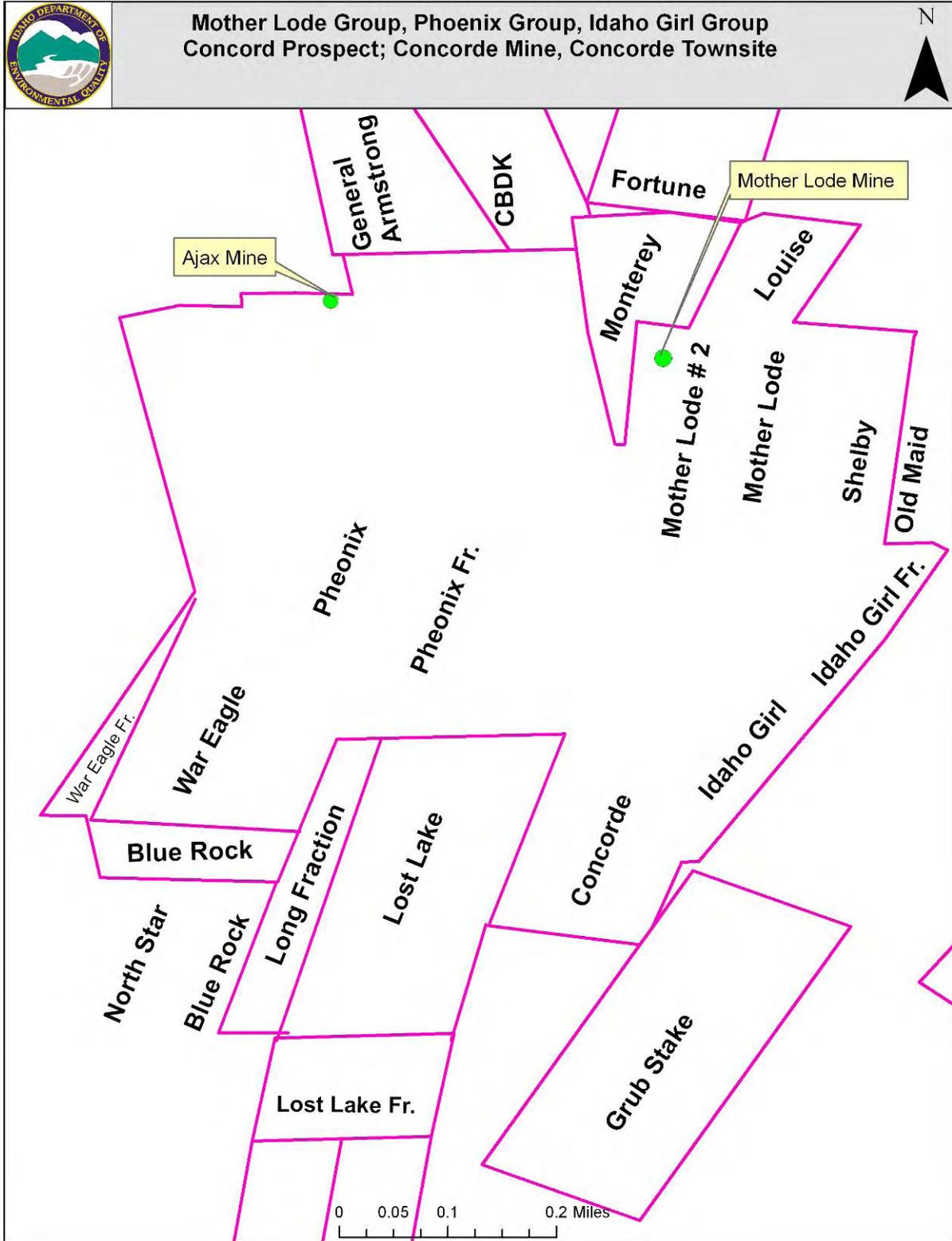


Figure 6. Idaho County Parcel Map with Claim Names: Concord (Concorde) Town Site, Ajax Mine, and Mother Lode Group (Idaho DEQ GIS ArcSDE 9.2 Geodatabase)

Table 1. Buffalo Hump Mining District Mines, Mills, and Ownership

Mine/Mill Site	Owner(s)	Mine AKA	Township	Range	Section(s)	Latitude (N)	Longitude (W)	DEQ Status
Vesuvius Mine	Steve Evans 85 Fuller Drive Madison, WI 53704	Yankee Boy Prospect Blue Ribbon Ruby Place	26N	6E	1, 2, 11, 12	45.6148388	115.674005	NRAP
	Unknown Owner	Emerald Vesuvius Fraction Hope Iron Cap Yankee Boy Osito Shadow Vesuvius Ridge Dead Tree No. 1						
Alhambra Mine	USDA Forest Service Nez Perce National Forest 104 Airport Road Grangeville, ID 83530	San Francisco Group Alhambra Prospect Alhambra	26N	6E	24	45.57889	115.66588	NRAP
	John Meyer c/o Larry Allen 11567 W. Divide Pass Ct. Boise, ID 83709	St. Paul Mill Site St. Paul Fraction San Francisco Prospect San Francisco Gem City						
	Lester & Diana Wart 1015 Wells Bench Drive Orofino, ID 83544							
	Lawrence & Doris Harrison Family Trust PO Box 583 Patterson, CA 95363 Parcel No: RP26N06E230610							
	Unknown Owner							
Spokane Mine	USDA Forest Service Nez Perce National Forest 104 Airport Road Grangeville, ID 83530		26N	6E	24	45.56877	115.66400	NRAP

Table 1. Buffalo Hump Mining District Mines, Mills, and Ownership (continued)

Mine/Mill Site	Owner(s)	Mine AKA	Township	Range	Section(s)	Latitude (N)	Longitude (W)	DEQ Status
Tiger Prospect	USDA Forest Service Nez Perce National Forest 104 Airport Road Grangeville, ID 83530		26N	6E	24	45.57542	115.66456	NRAP
Altoona Mine	USDA Forest Service Nez Perce National Forest 104 Airport Road Grangeville, ID 83530		26N	6E	14	45.57195	115.66965	NRAP
Big Buffalo Mine	LL-3 LLC 801 Rose Creek Road Pullman, WA 99163	Alligator Mine Merrimac Mine Alligator	26N	6E	2, 11	45.607383	115.686250	NRAP
	Josephine Riggins Estate c/o Bea Libey Route 1, Box 158 Pullman, WA 99163	Merrimac Thistle Ajax #2 Texas						
	LLC Mountain Fund 1912 North 17 th Street Boise, ID 83702	Trilby Maremack Fraction Buffalo Bull						
	Helen Stowell W. 2501 Mallan Avenue Spokane, WA 99201	Oro Fino Wedge Oro Fino Buffalo Hump Fraction						
	Steve Evans 85 Fuller Drive Madison, WI 53704	Merrimack Molly Gibson Clara B						
	Diana Sanman 238 Lakspur Lane Lewiston, ID 83501	Pirate Red Cross Improvement Lode & Mill Site						
	Thomas & Charlotte Hamilton c/o Gaedon/Enderby Hamilton 1260 Coast Village Circle Santa Barbara, CA 93108 Parcel No: RP26N06E116475	Hattie B						
	Charles & Deborah Veach 591 Morningside Drive Winston Salem, NC 27107							
	Larry Allen 8 Mt. Idaho Cemetery Road Grangeville, ID 83530							

Table 1. Buffalo Hump Mining District Mines, Mills, and Ownership (continued)

Mine/Mill Site	Owner(s)	Mine AKA	Township	Range	Section(s)	Latitude (N)	Longitude (W)	DEQ Status
Del Rio Mine and Mill	USDA Forest Service Nez Perce National Forest 104 Airport Road Grangeville, ID 83530	Venture Prospect Unpatented Claims	26N	6E	26	45.556217	115.681650	NRAP
Rob Roy Mine	USDA Forest Service Nez Perce National Forest 104 Airport Road Grangeville, ID 83530	Dice Mine Unpatented Claims	27N	6E	35	45.63080	115.68185	NRAP
Dice Mine	Richard & William Behrens 14300 Trillium Blvd. SE Unit 19 Mill Creek, WA 98012 Jason & Sara Wharton 1974 E. 3700 S. Malta, ID 83342	Virginia Lode Claims Dice Virginia Christel Lake	26N	6E	2	45.62395	115.687150	NRAP
Wise Boy Mine and Mill	USDA Forest Service Nez Perce National Forest 104 Airport Road Grangeville, ID 83530 Lowell Oliver 1324 McCarrol Clarkston, WA 99403 William & Laura Niemela PO Box 141 Monitor, WA 98836 George & Sue Lavalley 21847 Peter Grub Road Renton, WA 98055 Lenora Groom 202 W. North Street Grangeville, ID 83530 Everett D. Sneed 14674 Deon Drive Sonora, CA 95370	North Star Wise Boy Lode Tennessee American Rob Roy	27N	6E	26, 35, 36	45.638283	115.682267	NRAP

Table 1. Buffalo Hump Mining District Mines, Mills, and Ownership (continued)

Mine/Mill Site	Owner(s)	Mine AKA	Township	Range	Section(s)	Latitude (N)	Longitude (W)	DEQ Status
Mother Lode Mine	Gary & Kathleen Showalter 1806 NE 41 st Circle Vancouver, WA 98663	Mother Lode Group Phoenix Group Idaho Girl Group Concord Prospect Concorde Mine Concorde Town Site Concorde Mother Lode No. 2 Mother Lode Fraction Shelby Shelby Fraction Phoenix Idaho Girl Louise Phoenix Fraction	27N	6E	35	45.63080	115.68185	NRAP
St. Louis Mine	John Zehner 254 Paradise Road Grangeville, ID 83530 James Zehner 780 Elm Street Grangeville, ID 83530	St. Louis Lode St. Louis Mill Site St. Louis Fraction	26N	6E	23, 26	45.570100	115.682767	NRAP
Cracker Jack Mine	Norman Brock Jr. 5719 Cary Grant San Antonio, TX 78240 Parcel No: RP26N06E014960 Jean Cleary Howard et al c/o Brad Howard 8729 Onandaga Clarkston, MI 48348-3460 Parcel No: RP26N06E014970 Steve Evans 85 Fuller Drive Madison, WI 53704	Cracker Jack Santa Rosa White Bird	26N	6E	1, 12	45.617463	115.667577	NRAP

Table 1. Buffalo Hump Mining District Mines, Mills, and Ownership (continued)

Mine/Mill Site	Owner(s)	Mine AKA	Township	Range	Section(s)	Latitude (N)	Longitude (W)	DEQ Status
Jumbo Mine and Mill	Gene & Karen Evans 4799 Daley Drive DeForest, WI 53532	Brooklyn Mine & Mill Jumbo Camp Jumbo	26N	6E	23, 26	45.559.383	115.680533	NRAP
	Buffalo Hump LLC 4799 Daley Road DeForest, WI 53532	Extension of the Jumbo Lucy Baby						
	James Karr c/o Jerry Karr 11009 Mission Lakes Avenue Las Vegas, NV 89134	Yale Buffalo Horn Unpatented Claims						
	Bertha Shissler 2705 13 th Street Clarkston, WA 99403							
	EMM LLC c/o Steve Evans 110 EVCO Circle DeForest, WI 53532							
	USDA Forest Service Nez Perce National Forest 104 Airport Road Grangeville, ID 83530							
Lucky Lad Mine	LL-3 LLC 801 Rose Creek Road Pullman, WA 99163	Lucky Lad Deposit Alligator	26N	6E	2	45.620503	115.684216	NRAP
	Josephine Riggins Estate c/o Bea Libey Route 1, Box 158 Pullman, WA 99163							
Atlas Mill	Gene & Karen Evans 4799 Daley Drive DeForest, WI 53532 Parcel No: RP26N06E117078	Colonel Sellers	26N	6E	11	45.595067	115.683600	NRAP
	Shirley Bade – Trustee 680 E. Riverside Harbor Drive Post Falls, ID 83854 Parcel No: RP26N06E117078							

Table 1. Buffalo Hump Mining District Mines, Mills, and Ownership (continued)

Mine/Mill Site	Owner(s)	Mine AKA	Township	Range	Section(s)	Latitude (N)	Longitude (W)	DEQ Status
Atlas Mine and Mill	Jean Cleary c/o B.R. Wagner 520 SW Colony Road Portland, OR 97219	Fortune Deposit General Armstrong Fortune Monterey	26N	6E	11, 14	45.592433	115.68485	NRAP
	Shirley Bade – Trustee 680 E. Riverside Harbor Drive Post Falls, ID 83854	Baltic CBDK Atlas Lode						
	Gene & Karen Evans 4799 Daley Drive DeForest, WI 53532							
	Michael McNichols c/o Jack Fairley PO Box Drawer 1510 Lewiston, ID 83501 Parcel No: RP26N06E117300							
	Unknown Owner							
Sheep Creek Placers	Gene & Karen Evans 4799 Daley Drive DeForest, WI 53532 Parcel No: RP26N06E151225	Sheep Creek Glen Moningstar Jupiter	26N	6E	11, 14, 15	45.593266	115.699766	NRAP
	Shirley Bade – Trustee 680 E. Riverside Harbor Drive Post Falls, ID 83854 Parcel No: RP26N06E151225	Neptune Venus Jubilee						
	Travis & Tiffany Mink PO Box 73 Council, ID 83612 Parcel No: RP26N06E116455							
	Unknown Owner							
Ajax Mine	Gary & Kathleen Showalter 1806 NE 41 st Circle Vancouver, WA 98663	Phoenix Group Lost Lake War Eagle Fraction Water Eagle Phoenix Ajax Ajax Fraction Phoenix Fraction Blue Rock	26N	6E	23	45.587633	115.686600	NRAP

Table 1. Buffalo Hump Mining District Mines, Mills, and Ownership (continued)

Mine/Mill Site	Owner(s)	Mine AKA	Township	Range	Section(s)	Latitude (N)	Longitude (W)	DEQ Status
Winslow Prospect	Agnex Quilan 20032 Parkwood Circle Spokane, WA 99223	Winslow	26N	6E	1, 2	45.620966	115.67125	NRAP
	Rachel Parlet 2929 S. Waterford Drive #420 Spokane, WA 99203							
	W. Mac Roberts PO Box 8542 Spokane, WA 99203							
	Fred & Gordon Wilson PO Box 110201 Bear Lake, CA 92315							
Dewey Occurrence	Unknown Owner		26N	6E	23	45.57361	115.68764	NRAP

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Section 3. Overview and Location

Access to a small portion of the claims in the Buffalo Hump Mining District (aka Robbins Mining District) was granted to DEQ by property owners of those claims. Because access was not granted on a large number of patented mining claims, DEQ used a watershed approach to complete the site assessment of the entire mining district. This means DEQ collected data and made observations about historic mining impacts on the watershed from publicly accessible roads and view points, as well as from the private properties, which DEQ had been explicitly granted access. The watershed data and observations were used to make specific conclusions regarding each of the private and public properties, including the cumulative effects of historic mining and milling in the watershed.



Photo 1. Historic marker at Orogrande town site north of the Buffalo Hump Mining District (7/26/10)

The Buffalo Hump Mining District is accessible by a number of means and from several different directions. Although the area can be accessed by foot, horseback, or by air, the routine means is by vehicle on a very rough road that begins at Orogrande Summit. Orogrande Summit is located approximately 14 miles south-southwest of Elk City, Idaho in the headwaters of the Crooked River near the historic mining town site of Orogrande. From Elk City to Orogrande and then on to Orogrande Summit the Crooked River Road is improved and provides access to the area for all types of vehicular traffic including large recreation vehicles (motor homes) and off road vehicles (ORV). From Orogrande Summit down to Lake Creek and back up through the Buffalo Hump Mining District four wheel drive (4WD) vehicles and/or off road vehicles (ORVs) with lots of clearance are necessary. DEQ recommends that anyone traveling into the Buffalo Hump area is very experienced in off road vehicle operation and maintenance as break downs are common. Lastly, one should expect that 4WD vehicles may still take as much as two and a half hours to travel the 12 mile distance from Orogrande Summit to Jumbo Camp located at the far

end of the mining district. Furthermore, many of the patented claims within the district are only accessible by foot.

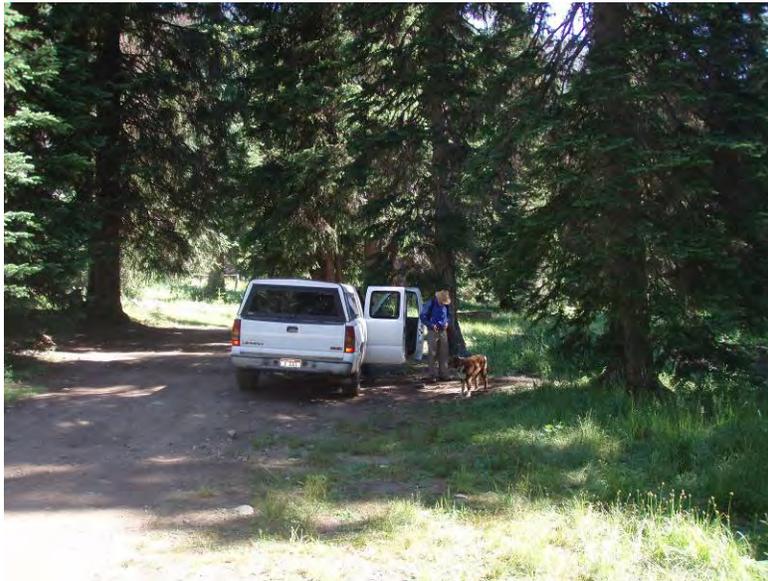


Photo 2. USFS campground at bottom of road from Orogrande Summit to Lake Creek (7/26/10)



Photo 3. Looking down the Devil's Staircase on the Yankee Boy claim (7/26/10)



Photo 4. Climbing the Devil's Staircase on the Yankee Boy claim (7/26/10)



Photo 5. Looking down onto the upper section of the Devil's Staircase (7/26/10)



Photo 6. Looking northwest towards the Buffalo Hump and the historic site of Humptown (7/26/10)



Photo 7. Buffalo Hump background sample location (7/21/10)



Photo 8. Road through the Concord town site and adjacent claims (7/28/10)



Photo 9. Road just above the junction to the road to Jumbo Camp and the St. Louis Mine (7/26/10)

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Section 4. Mining District History

There are well over 100 patented and unpatented mine and mill sites in the Buffalo Hump Mining District, which was and is often referred to as the Robbins Mining District. On these patented claims were at least 12 major mines (production exceeded 10,000 tons of ore), several conglomerated groups of claims, two mills, and three major community developments.

Most of the historical passages below are brief excerpts from P.J. Shenon's and J.C. Reed's "*Geology and Ore Deposits of the Elk City, Orogrande, Buffalo Hump, and Ten Mile Districts Idaho*" (1934) and Ted Erdman's and John Kauffman's "*Site Inspection Reports for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands Region 1 Nez Perce National Forest*" (IGS 2001). DEQ found very few reasons or basis to expound on these writings.

Vesuvius Mine

DEQ found no historical references to this mining claim and the workings located on it.

Alhambra Mine

Erdman and Kauffman (IGS 2001) wrote:

In the early 1930s, the Alhambra was owned by W. D. Vincent of Spokane, Washington, William Nichols, Frank Culbertson, and others (Shenon and Reed, 1934).

P.J. Shenon and J.C. Reed (1934) noted:

Little work has been done on the Alhambra, San Francisco, and Gold Crown Claims, but at the St. Louis, there was a 120-foot cross cut and a 95-foot drift along a strong vein. These four veins may be along one fissure, as each projects to the next....The Alhambra is owned by the group that owns the St. Paul: the San Francisco by F.A. Raney of Modesto California, the Gold Crown by A.F. Schultz, of Orogrande, and the St. Louis by the Galen L. Stone estate.

The trip reports and histories generated by Erdman and Kauffman (IGS 2001) were sufficient to complete DEQ's desktop analysis in 2010. In summary, IGS found no significant environmental or physical hazards at the site.

Spokane Mine

Erdman and Kauffman (IGS 2001) wrote:

In the early 1930's the mine was owned by A.F. Schultz and Pete Klinkhammer (Erdman and Kauffman 2001). It was developed by three levels (Shenon and Reed 1934). Esparza and others (1984) reported one adit that was at least 240 feet long, and five prospect pits or possibly caved shafts.

Although DEQ did not get legal access to assess the site, the trip reports and histories generated by Erdman and Kauffman (IGS 2001) were sufficient to complete DEQ's desktop analysis in 2010. In summary, IGS found no significant environmental or physical hazards at the site.

Tiger Prospect

Erdman and Kauffman (IGS 2001) wrote:

The Tiger Claims were located by L.J. Anderson in 1903 (Esparza et al 1984). In the early 1930s, the Tiger Prospect was owned by Lou Anderson (Shenon and Reed, 1934)

Although DEQ did not get legal access to assess the site, the trip reports and histories generated by Erdman and Kauffman (IGS 2001) were sufficient to complete DEQ's desktop analysis in 2010. In summary, IGS found no significant environmental or physical hazards at the site.

Altoona Mine

There was no historical information found except for the trip report by Erdman and Kauffman (IGS 2001).

Although DEQ did not get legal access to assess the site, the trip reports and histories generated by Erdman and Kauffman (IGS 2001) were sufficient to complete DEQ's desktop analysis in 2010. In summary, IGS found no significant environmental issues, but there were several significant physical hazards at the site.

Big Buffalo Mine

P.J. Shenon and J.C. Reed (1934) noted:

A stampede into the Buffalo Hump district followed the discovery of high-grade gold ore in out-crop of the Big Buffalo vein in the fall of 1898. Before the beginning of 1899 and in spite of deep snow and frigid weather the better known veins were located and development work was underway. By the summer of 1899 well-housed communities were established at Humptown, Concord and Calendar.... The Big Buffalo was closed by 1903, the Cracker Jack operated until 1907 and the Jumbo continued until 1915.

The Big Buffalo, now owned by the Sweeney Investment Co. of Portland Oregon, is at Humptown, a short distance southeast of the Buffalo Hump. The mine is entirely inaccessible now, but according to reports the workings consisted of a two-compartment shaft about 210 feet deep from which two levels were turned at

65 and 180 feet. About 190 feet of drifting was done on the first level, and 260 feet on the second. Several short cross cuts were driven from each level and considerable ground was stoped.

The Big Buffalo was the original discovery of the district, and according to reports the ore was first hauled to Calendar and was milled there. But later a 10 stamp mill was set up at the mine. In 1903 both mine and mill were closed.

The Big Buffalo Mine is owned by Mr. Steve Evans from Madison, Wisconsin. Mr. Evans operated the mine from 1981 to 1986 and reprocessed old dumps and mined ore from a small 50 foot by 300 foot open cut. There is also an 80 foot by 300 foot stockpile area. He raised the height of the tailings dam and milled about 1200 tons of ore.

In the fall of 2010, Mr. Evans with a venture partner submitted a Reclamation Plan Application to the IDL. Upon approval by IDL and any federal permitting required, the venture partners intend to have the mine back in operation by the summer of 2011.

Cracker Jack Mine (aka Cracker Jack Mill)

P.J. Shenon and J.C. Reed (1934) noted:

The old Cracker Jack Mine is located at the Head of Lake Creek, south of Calendar and about 1,000 feet above it. The owner is reported to be J.H. Howard of Long Beach California. The property is developed by several tunnels and there is considerable stoping, but a large portion of the old workings is inaccessible at the present time. The 20 stamp Cracker Jack Mill is at Calendar and was run by water power from Crystal Lake. The lower level, 600 feet above the mill, is partly open. A 1,000-foot crosscut intersects the vein, and about 800 feet of drifts can still be entered.

Winslow Prospect

DEQ did not find much on the development history of the Winslow Prospect but P.J. Shenon and J.C. Reed (1934) noted:

The Winslow Prospect of Ed Heightsman, of Ontario, Oregon, lies along Lake Creek about 1500 feet upstream of Calendar, below the Cracker Jack Mine. About 9 feet of quartz is exposed in a prospect pit. This vein strikes N 23° E and dips 80° SE.

Wiseboy Mine and Mill

Erdman and Kauffman (IGS 2001) wrote:

In the early 1900s, the Wiseboy Mine was owned by A. C. Moore, W. E. Kelly, and other, unnamed people from Grangeville. The upper tunnel on the property

exposed some of the richest ore in the district. The 600-foot-long lower tunnel missed the vein. A mill at the property never operated due to litigation.

It was finally sold at a sheriff's sale (Jellum 1909). By the early 1930s, the mine was owned by the E. N. Oliver estate of Grangeville, Idaho. The mine operated between 1900 and 1902, but showed little production (Shenon and Reed 1934). It may be connected underground with the North Star Mine, which is to the west and several hundred feet in elevation downhill.

North Star Mine

Erdman and Kauffman (IGS 2001) wrote:

There is no specific information on the history of the North Star Mine. However, the description of the adit suggests that it is the lower Wiseboy adit. That would mean the mill site is the remains of the mill built for the Wiseboy Mine (Erdman and Kauffman 2001).

Furthermore, it appears the remnants of the Rob Roy Mine and mill site are located on unpatented lands administered by the USDA Nez Perce National Forest. No claims research was undertaken to establish ownership of the unpatented claims.

Lucky Lad Mine

DEQ did not find any historical information on the Lucky Lad Mine.

Mother Lode (aka Concord Mine)

Erdman and Kauffman (IGS 2001) wrote:

The Mother Lode Mine was discovered in the fall of 1898 by P. I. Turner, who sold it that winter for \$100,000 dollars to Galen L. Stone (Shenon and Reed 1934). Within the next few years, eighteen claims at the mine were patented (Jellum 1909). Thomson and Ballard (1924) noted that the mine was called the "Concord," after the name of the company owning it. This may have been the Concord Mining Company, which was incorporated in 1903 and forfeited its corporate charter in 1915. In the early 1920s, the mine had a four-compartment shaft that extended to the bottom of the mine (to a estimated depth of between 277 and 295 feet), a single-compartment shaft extending to the first level of the mine (the vertical depth was 77 feet, but mine maps show this was an inclined shaft), and 1,620 feet of drifts and crosscuts (Thomson and Ballard 1924). The mine was inaccessible in the early 1930s and was owned by Galen Stone's estate (Shenon and Reed, 1934).

In 1987 and 1988, Pegasus Gold, Inc., drilled 5,000 feet to explore for gold in the Buffalo Hump district in an area that included the Mother Lode Mine.

Only a couple of buildings remain of the old Concord town site. However, the Concord airstrip adjacent to the old town site is maintained for small fixed wing aircraft. Currently, the claims making up the Mother Lode group are owned by Mr. Gary Showalter of Vancouver, Washington.

Ajax Mine

No history was found on the Ajax Mine. The significant workings and close proximity to the Mother Lode Mine may indicate it had a shared history and ownership with the Mother Lode.

Atlas Mine and Mill

No history was found on the Atlas Mine and Mill site. But the significant workings and close proximity to the Mother Lode Mine may indicate that it had a shared history and ownership with the Mother Lode.

Rob Roy Mine (aka Dice Mine)

Erdman and Kauffman (IGS 2001) wrote:

In the early 1900s, the Rob Roy and Dice claims were owned by E. M. Griffith of Grangeville, Frank Peck of Elk City, and L. C. Staley of Pullman. The Rob Roy had a 500-foot tunnel, and the Dice claim had a 450-foot tunnel (Jellum 1909).

St. Louis Mine

Erdman and Kauffman (IGS 2001) wrote:

In the early 1900s, the principal owner of the St. Louis Mine was Galen M. Stone of Boston, Massachusetts. The mine had a 160-foot shaft and 140 feet of drifts (Jellum 1909). In the early 1920's, the mine had an adit connecting to the shaft (Thomson and Ballard 1924). By the early 1930s, the property was owned by Galen Stone's estate. The workings included a 120-foot crosscut and a 95-foot drift along a strong vein (Shenon and Reed 1934).

In 1938, lessees at the St. Louis Mine produced several thousand tons of gold ore that was treated at the Clearwater Concentrating Company's custom mill at the mouth of Crooked River. In 1939, a lessee constructed a new 25-tpd floatation plant that operated a short time during the last quarter of the year. The mine and mill operated in 1940 and 1941.

The current owners are John and James Zehner of Grangeville, Idaho. The Zehner's currently use the site primarily for recreational purposes. They had a cabin built at the site, but it burned down in 2007 during the Rattlesnake Fire. The St. Louis Mine and St. Louis Fraction have been subdivided, and another owner (Darren Duby) of one of the parcels has recently constructed a new cabin on the site.

Jumbo Mine and Mill (aka Brooklyn Mill) and Jumbo Camp

Erdman and Kauffman (IGS 2001) wrote:

The property was located in the fall of 1898 (Shenon and Reed 1934). After a little development a 2-stamp mill was installed, which ran only for 30 days before 2 more stamps were added. The 4 stamps in a little over a year crushed ore that yielded over \$40,000. ... In 1902, a 24 stamp mill was installed and it ran about 2 years. Ore was taken out intermittently by lessees until about 1915. The US Bureau of Mines records for 1902 – 15 show a gold production of 18,179.43 fine ounces.

The Jumbo Mine and Milling Company Ltd was incorporated (Erdman and Kauffman 2001) in 1902. By 1905 the mine had four tunnels and a total workings of 4500 feet. The portal of the lower tunnel was at the mill which had twenty four stamps, five amalgamation plates, and three concentrating tables. During the dry season, there was insufficient water to power all of the stamps. Most of the ore was treated by amalgamation, but there was some gold bearing pyrite disseminated through the quartz. The pyrite was treated in a chlorination mill that had a capacity of one ton per day. In 1906 the mine continued to be the principal producer in the district with an output of 2,973 tons of ore, which yielded \$3.23 per ton in free gold from amalgamation, with concentrates being treated in the chlorination plant. The tailings carried considerable values and were cribbed for future treatment. The main tunnel was 1,250 feet long with a 210-raise connecting the two upper tunnels. There was apparently some activity at the mine the following year, but the Jumbo was idle from 1908 until July 1910 when the property was leased. Lessees worked the mine again in 1911 and milled ore with ten of the twenty four stamps in the mill...

By the early 1920s, the mine had four tunnels totaling over 2,700 feet... Production from the mine was valued at close to \$225,000 (Thomas and Ballard 1924). By the 1930s the workings were inaccessible.

From 1934 to 1938 lessees treated the old Jumbo Tailings using cyanidation. In 1937 they had treated 1,700 tons of old tailings.

In 1987 and 1988 Pegasus Gold, Inc. drilled 5,000 feet in the Buffalo Hump area. This project covered an area that included the Jumbo Mine.

Del Rio Mine and Mill (aka Venture Mine)

Erdman and Kauffman (IGS 2001) wrote:

In the early 1900s, the Del Rio consisted of ten claims owned by Gus Schultz, W.L. Farnsworth, M.F. Fuchs and George Terhaar of Cottonwood, Idaho. The property had a 1,000 foot long tunnel, and 25 tons of ore were run through the Jumbo Mill

(Jellum 1909). The property was active in 1913 by which time the name had been changed to Venture.

In the early 1930s the mine was owned by A.F. and C.A Schultz. The adit was 1,400 long and a two-stamp, water powered mill was on the property (Shenon and Reed, 1934). Bullion which was recovered by amalgamation and tables were produced in 1933 and 1934.

Although DEQ did not get legal access to assess the site, the trip reports and histories generated by Erdman and Kauffman (IGS 2001) were sufficient to complete DEQ's desktop analysis in 2010.

Dewey Occurrence

Erdman and Kauffman (IGS 2001) wrote:

There is very little information on the Dewey Occurrence except, as Erdman and Kauffman (IGS 2001) relate: In the early 1930's the Dewey Occurrence was owned by Reuben McGregor of Elk City.

Since that time numerous homes and recreational (skidoo) shacks have been built on the patented claims. During the site visit by the IGS in 1999, Erdman noted one small open adit with a tunnel and large waste dump approximately 70 foot by 30 foot by 15 foot. DEQ estimated the waste dump contained less than 1,000 cubic yards of waste.

Although DEQ did not get legal access to assess the site, the trip reports and histories generated by Erdman and Kauffman (IGS 2001) were sufficient to complete DEQ's desktop analysis in 2010.

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Section 5. Climatology

This brief climatic description was taken from a USFS document describing the Gospel Hump Wilderness. No weather station or instrumentation is situated in or near the Buffalo Hump Mining District. The summit of Buffalo Hump is 8,940 feet. The cool, moist lands at higher elevations are covered with Douglas fir, Lodgepole pine, Subalpine fir, and Whitebark pine in association with bear grass and/or whortleberry.

Mean annual precipitation is as high as 60 inches at higher elevations. Winter snow depths range from depths of 10 to 15 feet. Temperature extremes range from below 0 degrees Fahrenheit in the winter to above 85 degrees Fahrenheit in the summer months.

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Section 6. General Geology

The Buffalo Hump Mining District is located in Idaho County, Idaho about 20 air miles southwest of Elk City. This region is underlain by plagioclase-rich igneous intrusive rocks of the Atlanta lobe of the Cretaceous-age Idaho batholith. Broad areas of the batholith, including the Buffalo Hump Mining District, are overlain by regionally metamorphosed middle Proterozoic schist and gneiss (King and Valley 2001). The metamorphic rocks form roof pendants on top of the batholith. The generally dark colored intrusive and metamorphic rocks are crosscut by younger, light colored granite bodies that form distinct color bands on outcrop faces within the district (Figure 7).

Two distinct high-angle fracture systems deform the bedrock: a northeast trending set and a north, northeast trending set. Although shearing is observed along some fractures, due to the nature of the country rock and steep dips on the fractures, it is difficult to interpret offset along the fractures.

Of interest in the context of the PA process, economic mineralization is controlled by the north, northeast trending fracture set. The mineralized fractures have obvious surface expression of up to six miles (Lund, Snee, and Evans 1986). The major workings in the district are strongly associated with the well-defined fracture zones spanning from the Wiseboy/North Star claims on the north to the Jumbo Mine on the south.

Mineralization occurs within the fracture sets as nearly vertical, discontinuous quartz vein systems. The veins range in width from less than one foot to over 30 feet wide. The veins are predominantly milky white quartz. Associated mineralization is indicated by the presence of pyrite, chalcopyrite, and sphalerite with minor galena, arsenopyrite, and stibnite. The gold and silver ores occur as free metals in the quartz and as invisible inclusions within the sulfide minerals (Lund, Snee, and Evans 1986).

The sulfide mineralization is limited to discrete zones within the vein material and thin, discontinuous zones within the country rock. The sulfides occur as isolated sub- to euhedral crystals within a quartz matrix. Massive sulfides were not noted by researchers nor observed in the field during the investigation.

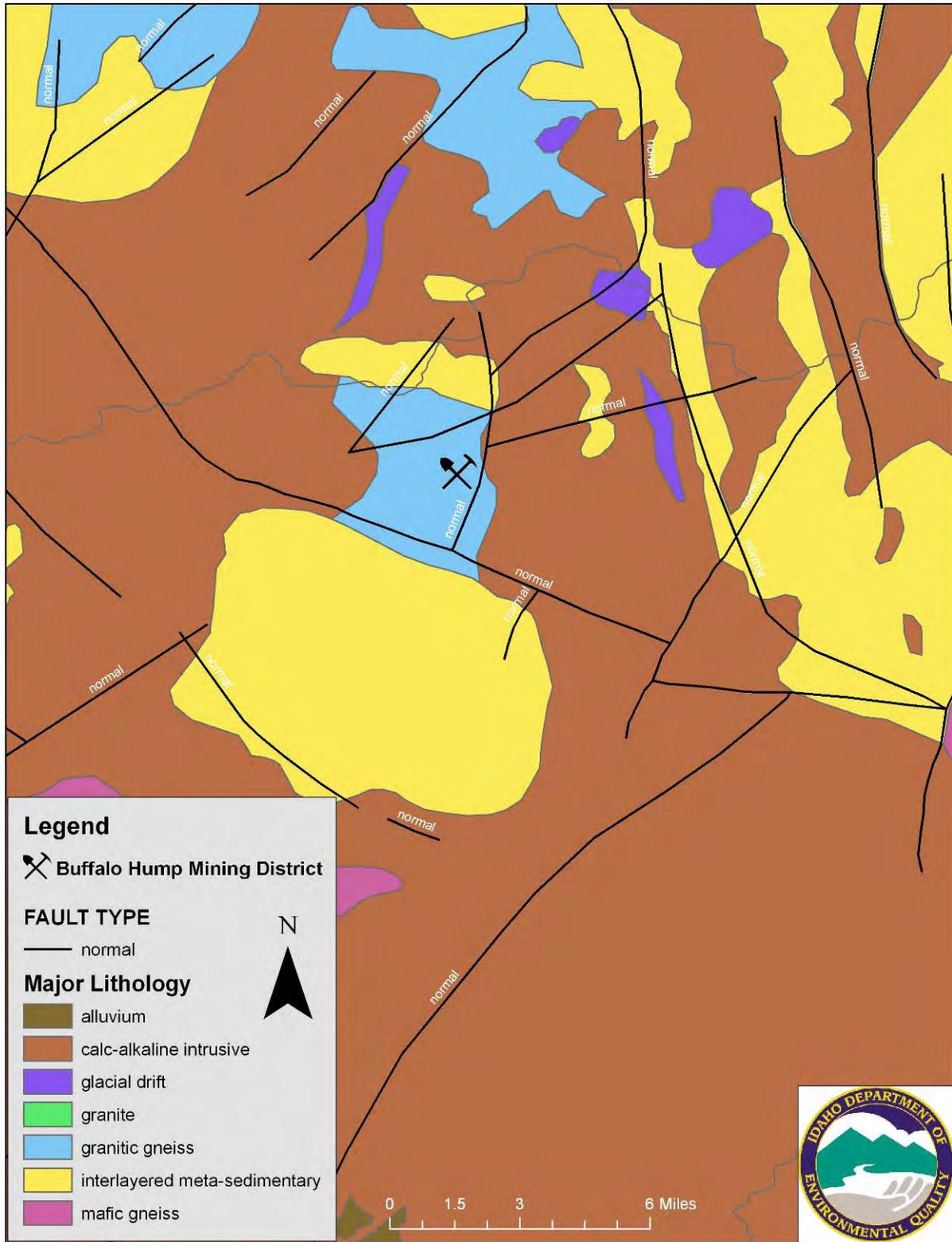


Figure 7. Major Lithology of the Buffalo Hump Mining District (Map Source: SDE Feature Class, USGS 1995; Idaho DEQ GIS ArcSDE 9.2 Geodatabase)



Photo 10. Intersecting granitic dikes and sills above the headwaters to Lake Creek near the Devil's Staircase (7/26/10)



Photo 11. The Devil's Staircase was hammered out of an exceptional example of Orbicular Granite (7/26/10)

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Section 7. Current and Potential Future Lands Uses

More than 100 years ago the beneficial use of lands and waters in the Buffalo Hump (Robbins) Mining District was mining, subsistence hunting and fishing, and associated commerce to support the mining operation industry. These uses expanded to include a broader market for timber, fur trapping, recreational hunting and fishing, camping, and ORV touring. However, with the exception of pack animals, very little evidence of livestock, specifically the cattle industry, was found at the site. It is likely the mining patents will continue to be subdivided and sold for recreational properties, a number of which have already been developed with homes and out building construction. At the time of this writing, at least 12 large residences have been constructed, another three or four are under construction, and numerous one-bedroom cabins are present. However, there continues to be a desire by some land owners to re-enter and re-develop the mineral values in this district.



Photo 12. Looking westward towards a number of recreational homes from the top of the Devil's Staircase (7/26/10)



Photo 13. Looking south across Hump Lake towards some of the recreational residences (7/27/10)

Section 8. Mine and Mill Site Conditions

Besides making observations and collecting data from properties where DEQ had legal access, DEQ used numerous observations and information contained in Ted Erdman's and John Kauffman's "*Site Inspection Reports for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands Region 1 Nez Perce National Forest*" (IGS 2001) to discuss site conditions at mines and on private properties where DEQ was not granted access.

The Buffalo Hump Mining District encompasses the headwaters of three watersheds including Ten Mile Creek, Sheep Creek, and Lake Creek, and eight sub-watersheds including Wise Boy Creek, Slaughter Creek, Butcher Creek, Kelly Creek, East Fork of Sheep Creek, Jumbo Creek, Whistle Pig Canyon, and Lake Creek (upper). For all intents and purposes the mining district is located on a large topographic high that drains radially to each of the cardinal directions. There are at least 13 lakes in the area including Wise Boy Lake(s), Kelly Lake(s), Fish Lake, Crystal Lake, Hump Lake, Mirror Lake, Bear Lake, Half Acre Lake, Shining Lake, Deer Lake, Round Lake, Ruby Lake, and Crescent Lake. There are many acres of wetlands in the areas around Jumbo Camp, Concord, and Frogtown, but none of them appear to be directly connected to any waste dumps nor adversely impacted by the historic mine developments.

For the purposes of evaluating all properties contained in the Buffalo Hump Mining District, it was necessary to attempt an arbitrary "lumping" or grouping of mine claim patents around the historic mine workings they may have supported or contained. There was no intent to draw any conclusions regarding liabilities of any patent owner or group of patent owners for the conditions of historic workings with which their properties have been grouped.

Furthermore, it is important to restate that no samples or data was collected on private properties where access was not explicitly provided to DEQ. Observations about properties and cumulative effects within the watershed were made as a result of access to public roads and private properties where DEQ did have access.

8.1 Vesuvius Mine

Other than the maps showing the location for the Vesuvius Mine, and physical evidence of the shaft and dump, little is known about the mine. An open shaft which is presumably the Vesuvius is located at Lat. 45.61814° N, Long. 115.67367° W. The Vesuvius shaft is located in the headwaters of Lake Creek approximately three quarters of a mile above the Calendar town site.

There are no signs of mine effluent or connectivity between the waste dump and the nearby banks of Lake Creek.

The shaft is open and although attempts were made to restrict access with fencing and signs, these measures are in disrepair and ineffective resulting in a dangerous physical hazard that should be managed. The waste dump contains less than 1,000 cubic yards of waste rock that appears to be largely country rock with some disseminated sulfides.

Although there are numerous signs of trespass by recreational users, the most significant risks noted were to the dangerous mine opening, not any wastes or heavy metals. DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Vesuvius Mine be designated as No Remedial Action Planned (NRAP).



Photo 14. Vesuvius Mine with fence and No Trespassing sign posted (7/21/10)

8.2 Alhambra Mine

The Alhambra Mine is located at Lat. 45.57889° N, Long. 115.66588° W on the canyon rim overlooking Bear Lake. DEQ did not visit the Alhambra Mine. However, Erdman and Kauffman of the IGS apparently did visit the site in 2000 and wrote the following observations about the Alhambra Mine in “*Site Inspection Report for Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands – Nez Perce National Forest*” (IGS 2001).

The adit is ¾ mile from the trail head and just west of the trail as it starts to descend the very steep slope above Bear Lake. The site is on Forest Service Land within the Gospel Hump Wilderness.

The adit explored a large quartz vein along a shear zone in biotite-granodiorite of the Idaho Batholith.

The property has one open adit about 20 feet long. The small amount of excavated material is scattered down the steep slopes. The disturbed area is minimal.

Erdman and Kauffman did not collect any soil or water samples. Based on their limited observations and assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited Erdman and Kauffman's observations and assumptions made regarding the site, DEQ is recommending the Alhambra Mine be designated as NRAP.

8.3 Spokane Mine

The Spokane Mine is located at Lat. 45.56877° N, Long. 115.66400°W on the canyon rim overlooking Ruby Lake. DEQ did not visit the Spokane Mine because legal access was not received for the property. However, Erdman and Kauffman of the IGS apparently did visit the site in 2000 and wrote the following observations about the Spokane Mine in "*Site Inspection Report for Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands – Nez Perce National Forest*" (IGS 2001).

...the mine is about 5/8 mile southeast of the trail and just south of Ruby Lake. The adits are approximately 600 feet south of the lake and are within the Gospel Hump Wilderness.

Esparza and others (1984) reported one adit was at least 240 feet long and five prospect pits or caved shafts.

This mine has two very minor collapsed adits. As noted by Shenon and Reed (1934) the property was developed on three levels. No evidence of a third tunnel was found, and the two adits that are described do not appear to have enough waste rock on them to have had multiple underground levels.

The waste rock dumps described by IGS contain less than 300 cubic yards and were not sampled. No water or waste samples were collected. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Spokane Mine be designated as NRAP.

8.4 Tiger Prospect

The Tiger Prospect is located at Lat. 45.57542° N, Long. 115.66456° W on the canyon rim overlooking Ruby Lake. DEQ did not visit the Tiger Prospect because it did not receive legal access to the property. However, Erdman and Kauffman of the IGS apparently did visit the site in 2000 and wrote the following observations about the Tiger Prospect in "*Site Inspection Report for Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands – Nez Perce National Forest*" (IGS 2001).

The adit is approximately 1,000 feet north of and 600 feet in elevation above the lake. The site is within the Gospel Hump Wilderness.

The site has one collapsed adit. The waste dump measures 35 feet long; 25 feet wide, and 10 feet thick indicating a relatively short adit. A pile of mine rails is on the dump in front of the caved adit. The disturbed area is minimal.

The waste rock dump described by IGS contains less than 200 cubic yards and was not sampled. No water or waste samples were collected. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Tiger Prospect be designated as NRAP.

8.5 Altoona Mine

The Altoona Mine is located at Lat. 45.57195° N, Long. 115.66965° W on the canyon rim and a spring that feeds Ruby Lake. DEQ did not visit the Altoona Mine because it did not receive legal access to the property. However, Erdman and Kauffman of the IGS apparently did visit the site in 2000 and wrote the following observations about the Altoona Mine in “*Site Inspection Report for Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands – Nez Perce National Forest*” (IGS 2001).

The adit is approximately 1,000 feet west of and 600 feet in elevation above the lake. The site is within the Gospel Hump Wilderness.

The site has one open pit and two shallow shafts. The adit is reported to be 90 feet long.... The dump is 45 feet long, 25 feet wide and 3 feet thick. It consists mostly of coarse rock fragments. The two shafts are west of the adit. Shaft 1, the northernmost of the two, is 15 feet deep, and Shaft 2 is 10 feet deep. A minor amount of scrap material is scattered around the site. The disturbed area covers less than 0.25 acres.

The waste rock dump described by IGS contains less than 200 cubic yards and was not sampled. No water or waste samples were collected. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Altoona Mine be designated as NRAP.

8.6 Big Buffalo Mine

The Big Buffalo Mine is located at Lat.45.60734° N, Long. 115.68610° W adjacent to the Humptown site.

In July 2010 when DEQ was conducting field exams for site assessments; legal access to the site had not been received. However, in September 2010 the property owners and their joint venture partners provided access to the IDL and DEQ to inspect the property prior to the writing, submittal, and agency approval of a Reclamation Plan for development of a surface mine at the Big Buffalo Mine.

Although there is one open, two compartment shaft on the property, the dominant feature is an extensive cat cut or trenching along the strike length of the Big Buffalo vein. However, the shaft reportedly (Shenon and Reed 1934) is driven to 210 feet and had at least 500 feet of additional developed workings from the shaft. This would have produced well over 1,000 cubic yards of waste most of which has become blended into the adjacent landscape and overgrown by native vegetation.

The following was provided by Robert Wetzel, one of the venture partners for the Big Buffalo Mine.

“Almost everything that came out of the pit went thru the mill. There is about 200 tons of waste on the road in various places. There is about 50 tons of ore spread out in the old stockpile area with little spruce growing thru it and about 70 tons in 5-6 small piles that we will run thru the mill early next year”.

The following is information obtained from the IDL reclamation plan application, provided by Mr. Wetzel. Development of the Big Buffalo Mine started in 1899 and by the early 1900’s at least 170 feet of shaft was sunk and 460 feet of crosscuts and drifts were driven. About 10,000 tons of ore were mined and milled. A square set stope up to 40 feet wide and about 200 feet long comes to the surface and is filled with water in the present open cut. Tailings from this period are impounded in the existing tailings pond (see photo below).



Photo 15. Big Buffalo Mine settling pond (8/18/10)

Mr. Steve Evans (the mine owner) operated the mine from 1981 to 1986 and reprocessed old dumps and mined ore from a small 50 foot by 300 foot open cut. There is also an 80 foot by 300 foot stockpile area. He heightened the tailings dam and milled about 1200 tons of ore. The tailings dam is about eight feet high and holds one to three feet of water to a level about one foot below the top of the dam over about 6,000 square feet. A diversion ditch from the mine past the

tailings dam was constructed to keep surface water from entering the tailings pond. There is a 30 foot by 40 foot equipped mill building, a 20 foot by 25 foot cabin, a 20 foot by 30 foot shed and an 8 foot by 20 foot container on site.



Photo 16. Big Buffalo Mine historic mine trenching and caved slope; mill building in the background (8/18/10)



Photo 17. Outcrop of ore at the Big Buffalo Mine (8/18/10)

Mr. Evans and Mr. Wetzel were both on site and indicated they will begin production in the summer of 2011. They do not have a closure/reclamation date. This will be determined by the production of the mine and the price of gold. The property was inspected for any suspect hazardous wastes or material such as filled barrels or containers and none were present.

Mr. Wetzel commented during the site visit he intends to sample the water which has filled the shaft and a pit along the trench. If he has the water sampled, this information would be provided to the IDL and presumably then to DEQ.

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. If the mine reopens, mine workers at the Big Buffalo Mine are likely to receive exposures via air and soil pathways. Although this is an inherent risk of the job, a mine site safety and health plan required by the Mine Safety and Health Administration (MSHA) should account for management of these risks. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Big Buffalo Mine be designated as NRAP.

8.7 Cracker Jack Mine (aka Cracker Jack Mill)

The Cracker Jack Mine is located at Lat. 45.61789° N, Long. 115.66546° W about 1500 feet upstream on Lake Creek near the old town site of Calendar. As far as DEQ could determine, the Cracker Jack Mill site was located in or immediately adjacent to the town site.

Although over 2,000 feet of mine workings produced in excess of 8,100 tons of crude ore from 1902 to 1910 (Shenon and Reed 1934), very little remains of the waste dumps generated by three adits and workings developed on the Cracker Jack.

DEQ did not receive access to enter the property. However, DEQ was able to make qualitative observations of the mine from an overlook on the Devils Staircase. DEQ was able to see very little remains of historical adits and dumps at the Cracker Jack Mine on the canyon walls. DEQ also used water quality data collected below the Calendar town site at Lake Creek (upper) to assess the cumulative effects of mine and mill sites, particularly the Vesuvius, Cracker Jack, and Winslow, and determine if any significant human health or ecological risks existed.

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Cracker Jack Mine be designated as NRAP.

8.8 Winslow Prospect

The Winslow Prospect has one collapsed adit on the property located at Lat. 45.62123° N, Long. 115.67128° W. The prospect is in a densely re-forested area, and there is no apparent effluent from the adits nor delivery of wastes from the small (<100 cubic yard) waste dump to Lake Creek.



Photo 18. Boiler or steam compressor on Winslow Prospect (7/29/10)

Exploration of the Winslow patented claim revealed a small overgrown waste dump presumably from the discovery pit for the claim. Otherwise, there are no indications of major impacts by historic mining on the landscape or adverse effects to the watershed.



Photo 19. Typical vegetation across entire Winslow Prospect (7/29/10)

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited

observations and assumptions made regarding the site, DEQ is recommending the Winslow Prospect be designated as NRAP.

8.9 Wiseboy Mine and Mill (aka American, Tennessee, Rob Roy Extension, Wise Boy, and North Star claims)

The Wiseboy Mine adit is located on patented lands at Lat 45.63823° N, Long. 115.6815° W in the easternmost headwaters of Wiseboy Creek.

The Wiseboy Mine was likely located by the staking of the American, Rob Roy Extension, Wise Boy, and Tennessee patented claims and the North Star unpatented claim. Although mapped and named separately, it is likely the North Star Mine is actually the adit for the lower level of the Wiseboy Mine.

Similar to other mines in the Buffalo Hump Mining District, the Wiseboy was developed on a quartz rich vein in biotite granodiorite of the Idaho batholith. Apparently the vein is quite rich and was the cause for a mill to be constructed at the site. However, the mill was never operated and there is no evidence of hazardous or otherwise deleterious materials at the mill site which since its construction has burned down.

The Wiseboy adit was open at the time of the IGS visit in 2001, but DEQ did not find it open during their visit in July 2010. The waste dump is quite small consisting of less than 50 cubic yards of material and is mostly granodiorite.

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Based on these observations and assumptions made regarding the site, DEQ is recommending the Wiseboy Mine and Mill be designated as NRAP.



Photo 20. View of Crystal Lake along the trail into the North Star, Wise Boy, Rob Roy, and Tennessee claims (7/28/10)



Photo 21. View of Upper Kelly Lake along the north side of Wiseboy, Rob Roy Extension, and Tennessee patented claims (7/27/10)



Photo 22. Looking south across Wiseboy and Tennessee patented claims (7/28/10)



Photo 23. North Star and Wiseboy Mill site (7/28/10)

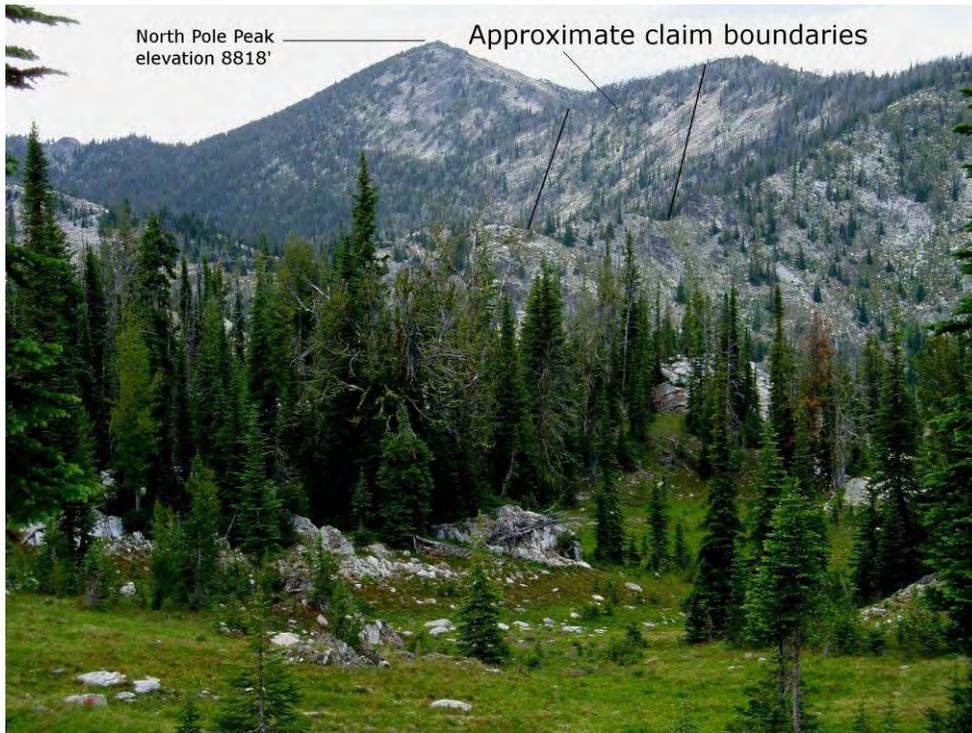


Photo 24. Panoramic view of claims (7/27/10)

8.10 North Star Mine (aka North Star claim)

The North Star Mine adit and mill site are located on lands administered by the USFS at Lat. 45.63813° N, Long. 115.68283° W below the Wiseboy adit and just inside the Gospel Hump Wilderness boundary. As noted in the description of the Wiseboy Mine, the mill was never operated and there is no evidence of hazardous or otherwise deleterious materials at the mill site which has since burned down.



Photo 25. North Star and Wiseboy Mill site (7/28/10)



Photo 26. North Star and Wiseboy Mill site (7/28/10)

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Based on these observations and

assumptions made regarding the site, DEQ is recommending the North Star Mine be designated as NRAP.

8.11 Lucky Lad Mine (aka Lucky Lad and Alligator claims)

The Lucky Lad Mine is located on the Alligator and Lucky Lad patented mine claims at Lat. 45.62009° N, Long. 15.68450° W. Half of the Alligator claim extends southward over Hump Lake. The Lucky Lad is north of the Alligator claim.

DEQ passed through the Lucky Lad Mine on the way to complete the site visit at the Wiseboy Mine. Because DEQ did not have legal access to complete a site inspection, observations were made exclusively from the trail used by backpackers and hunters. From this vantage point DEQ observed a collapsed adit, collapsed shaft, two collapsed buildings, and a small (<1,000 cubic yards) waste dump. There did not appear to be any mine drainage or connection between the waste dump and Hump Lake to the south.

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Based on these observations and assumptions made regarding the site, DEQ is recommending the Lucky Lad Mine be designated as NRAP.



Photo 27. Looking south across the Lucky Lad Mine adit and Hump Lake towards the recreational homes (7/28/10)



Photo 28. Lucky Lad adit, waste dump, and collapsed shaft (7/28/10)



Photo 29. Lucky Lad adit, waste dump, and collapsed shaft (7/28/10)

8.12 Mother Lode Mine (aka Concord Mine, Mother Lode Group, and Concord Town Site)

The Mother Lode Mine is surrounded by a number of patented mining claims each of which has a different level of mine and ancillary facilities development on them. These include mineral prospects, shafts, tunnels, collapsed buildings and sheds, the remnants of the town of Concord, and an airstrip. Patented mining claims thought to be closely associated with the Mother Lode Mine include the Concord, Mother Lode, Mother Lode No. 2, Mother Lode Fraction, Shelby, Shelby Fraction, Phoenix Group, and Idaho Girl Group.

The Concord town site and buildings for the airstrip are located at Lat. 45.54485° N, Long. 115.68192° W.

The historic town site of Concord spans several patented mining claims and contains an airstrip. Access is gated and locked to protect parked aircraft from unwelcome visitors. There are very few indications a town site was actually located at Concord. The most prominent are the cabin and out-buildings located next to the airstrip. The cabin has been preserved and it is possibly the remnants of one of the historic houses of ill repute.



Photo 30. The historic town site of Concord spans several patented mining claims and is used locally as an airstrip. Access is gated and locked to protect parked aircraft from unwelcome visitors (7/27/10)



Photo 31. There are very few indications a town site was actually located at Concord. The most prominent are the cabin and out buildings located next to the airstrip (7/26/10)



Photo 32. Airplane next to landing strip. Large building is a preserved cabin possibly one of the historic houses of ill repute (7/26/10)



Photo 33. The Mother Lode Mine shaft and waste dump are located just west of the airstrip at the Concord town site (7/27/10)



Photo 34. The Mother Lode shaft is open, but covered by a log deck presumably as a safety measure to restrict access (7/27/10)



Photo 35. A fuel tank (empty) is present at the Mother Lode shaft site. It was placed inside of a bermed area, but no liner is present (7/27/10)



Photo 36. A second fuel storage tank and empty 55 gallon drum were located on the Mother Lode shaft dump. The relatively small volume of oil stained waste rock appeared very old and no longer an issue (7/27/10)



Photo 37. There is a large volume of solid wastes piled up around the Mother Lode waste dump. There is no evidence any of it contains hazardous or deleterious wastes or liquids (7/27/10)



Photo 38. This well preserved hoisting bucket is on the ground near the Mother Lode shaft (7/27/10)



Photo 39. Mother Lode Fraction claim corner Lat. 45.58938° N, Long. 115.68102° W (7/27/10)



Photo 40. Moose with calf at the Concord town site (7/27/10)

The waste dump contains less than 2,000 cubic yards. There are no visible signs of active erosion. The waste dump contains approximately 90 percent country rock and <10 percent ore with little or no massive sulfides. There is an empty diesel tank on top of the waste dump. The shaft is covered with a log decking. The composite sample (MLWDSS1) was collected from 12 locations on the top and toe of the waste dump.

Although there are minor amounts of petroleum contaminated soils and large volumes of solid wastes located around the Mother Lode shaft, they are relatively insignificant. Nevertheless, the property owner should manage these wastes and if development occurs in the future at the site,

containment of these regulated wastes should be upgraded significantly. It is unlikely significant human health or ecological risks exist at this site. Based on these observations and assumptions made regarding the site, DEQ is recommending the Mother Lode Mine be designated as NRAP.

One of the claims of the Mother Lode Group is the Louise claim, which is along the northwest corner of the airstrip. On the Louise claim there is a small shaft at Lat. 45.58823° N, Long. 115.68094° W. This opening is not very deep (<20 feet), but it is a dangerous physical hazard and access should be restricted.



Photo 41. Louise Mine shaft (7/27/10)

8.13 Ajax Mine

The Ajax Mine is located very close to the Mother Lode Mine at Lat. 45.59090° N, Long. 115.68639° W. The Ajax Mine is surrounded by mixed ownership lands of both private and public lands administered by the USFS. Although speculation by DEQ, the surrounding claims may have been located to support development of the Ajax Mine including the War Eagle, War Eagle Fraction, Long Fraction, Lost Lake, and Blue Rock.

The Ajax Mine contains an open shaft and a multi-lobed waste dump that contains less than 1,000 cubic yards of mostly biotite granodiorite country rock. Surrounding claims have numerous exploration pits and trenches on them.



Photo 42. Trench on Ajax patented claim above a pond (7/27/10)



Photo 43. Open Ajax shaft (7/27/10)

The open Ajax Mine shaft is a significant dangerous physical hazard that should be closed or fenced to prevent access.



Photo 44. Open Ajax shaft (7/27/10)



Photo 45. Ajax waste dump (7/27/10)



Photo 46. Ajax (Cor. 5) and Ajax Fraction claim corner Lat. 45.58818° N, Long. 115.68646°W (7/27/10)

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Based on these observations and assumptions made regarding the site, DEQ is recommending the Ajax Mine be designated as NRAP.



Photo 47. Ajax Mine trench with waste piles (7/27/10)

8.14 Atlas Mine and Mill

Although DEQ did not have legal access to assess the Atlas Mine and Mill site, DEQ made several observations about the mine and mill site while traversing the area to find the claim corners for properties where access had been granted. The Atlas Mine is surrounded by a number of patented claims DEQ presumes may have been located to explore and develop the mine and associated veins. These include the General Armstrong, CBDK, Fortune, Monterey, Monterey Fraction, and Baltic patented claims.

The Atlas Mine collapsed adit is located at Lat. 45.59116° N, Long. 115.68418° W off the north end of the Concord airstrip. The waste dump is adjacent to the adit where there is less than 10 cubic yards of waste, presumably from the Atlas Mine. There is also a small shaft on the Atlas Mine that shows some exceptional sulfide mineralization in a quartz stockwork. This material might have been destined for the Atlas Mill. Unfortunately the mill facility burned down in the Rattlesnake Fire.



Photo 48. Atlas Mine collapsed adit (7/27/10)

There are approximately 50 cubic yards of waste/tailings at the mill site. There were no signs of hazardous materials of waste in the ruins of the burned out mill.



Photo 49. The Atlas Mill building (7/27/10)



Photo 50. Pile of hand cobbed and broken ore at the Atlas Mill (7/27/10)



Photo 51. Atlas exploration trench with waste piles (7/27/10)

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Based on these observations and assumptions made regarding the site, DEQ is recommending the Atlas Mine and Mill site be designated as NRAP.



Photo 52. Trenching on the Atlas Mine (7/27/10)

8.15 Rob Roy Mine (aka Dice Mine)

The Rob Roy Mine has been referenced by the IGS and previous authors as the Dice Mine, presumably because they thought the Dice and Rob Roy Extension claims were adjacent. However, according to the BLM GLO files the claims are not adjacent to one another. Therefore, DEQ presumes the Rob Roy Mine is the one located on unpatented ground administered by the USFS at Lat. 45.63080° N, Long. 115.68185° W and several hundred feet north of Crystal Lake. The Virginia, Dice, and Christel Lake lode patented mining claims do not appear connected to this minor development.

The Rob Roy Mine was developed on a quartz vein within a calc-silicate gneiss and schist unit (Erdman and Kauffman, IGS 2001).

The Rob Roy Mine has only one collapsed adit and a very small (<100 cubic yards) waste dump. Although there is a minor seep from the collapsed adit, IGS did not collect or analyze water or waste samples. However, assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Rob Roy Mine be designated as NRAP.

8.16 St. Louis Mine

The St. Louis Mine is located at Lat. 45.57019° N, Long. 115.68313° W in the headwaters of the west fork of Jumbo Creek. The St. Louis Mine was developed on the St. Louis and St. Louis patented mine claims.

The St. Louis Mine has several open adits, shafts, and raises that all seem to connect to one lower level. Approximately two gallons per minute (gpm) of water is flowing from the lower adit. The waste dump at this level contains less than 500 cubic yards of waste that does not seem to contain much in the way of sulfides. However, there is evidence of a small grizzly and jig set up, where screens and less than five cubic yards of jig tailings remain. Water sample SLADSW1 was collected at the site of the lower adit.



Photo 53. The lower St. Louis Adit #1 waste dump (7/28/10)



Photo 54. The lower St. Louis patented claim and lower workings overlook a large meadow and six small recreational homes on the Dewey Occurrence (7/28/10)



**Photo 55. Remains of foundation adjacent to the lower St. Louis Adit #1
(7/28/10)**



Photo 56. A tailings pile at the St. Louis Mine (7/27/10)



Photo 57. Tailings from a shaft at the St. Louis Mine (7/28/10)



Photo 58. Collapsed shaft at the St. Louis Mine (7/29/10)



Photo 59. Collapsed tunnel at the St. Louis Mine (7/28/10)



Photo 60. Cabin of Darren Duby on the St. Louis claim (7/28/10)



Photo 61. Recreational home on Dewey Occurrence approximately 2,000 feet northwest of the St. Louis Mine (7/29/10)

Two partially collapsed shafts connect tunnels and stopes from the lower St. Louis adit to the surface. These shafts are located at Lat.45.56979° N, Long. 115.68246° W and Lat. 45.57013° N, Long. 115.68219° W, respectively. Both shafts are very dangerous physical hazards and should be closed or fenced.

There are several collapsed adits and minor waste dumps on the St. Louis that pose no significant human health or ecological risks.

The open adits, tunnels, and stopes present very dangerous physical hazards and should be closed or fenced. Water quality field parameters were measured at the site and laboratory analysis were unremarkable. The water sample exceeded the DEQ Acute Cold Water Biota Standard for cadmium by four times, copper by 10.2 times, and zinc by 2.56 times. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the St. Louis Mine be designated as NRAP.

8.17 Jumbo Mine and Mill (aka Brooklyn Mill) and Jumbo Camp

The Jumbo Mine and Mill are located at Lat. 45.55812° N and Long. 115.67868° W; presumably on the Jumbo, North Jumbo, Jumbo Extension, Rams Horn, Little Giant, Yale, Brooklyn, and Buffalo Horn. Historic references to the Jumbo Mill also call it the Brooklyn Mill because for a short period of time it was operated by the Brooklyn Mining and Milling Company. Jumbo Camp is located at Lat. 45.55915° N and Long. 115.688869° W on USFS administered unpatented mine claims.



Photo 62. View looking down into Jumbo Camp from the eastern flanks of Concord Hill and the Dewey Occurrence claims (7/28/10)



Photo 63. Looking up through Jumbo Camp from the road. A dispersed campground is just right of the view in the trees (7/28/10)

Although it has not been referenced by the more recent IGS historical articles, DEQ found a burned down and collapsed tramway and wheel house just below Jumbo Camp that appeared to connect the access road to the underground workings and mill site located in the canyon below. Although the artifacts, including roofing and hoist, at the location for the wheelhouse appear to be modern equipment, DEQ did not find any references that dated this part of the mine facility.

The Jumbo Mine tramway and headframe had been burned and only a very small amount of ore was found at the site. This indicates most of the ore had been shipped or otherwise removed

from the site. However, what did remain is heavily iron stained quartz. It is vuggy with limonite formations inside of rhombic vugs that were presumably pyrite crystals prior to weathering and alteration. Although oxides are pervasive, there are no other indications of massive sulfide presence.



Photo 64. Looking down onto Jumbo Camp and up to Concord Hill from a spot near the Jumbo Mine tramway (7/27/10)



Photo 65. Looking down onto the site of the Jumbo Mine aerial tramway(s) near Jumbo Camp (7/27/10)



Photo 66. Remnants of one of the hoists for the Jumbo Mine tramway near Jumbo Camp (7/27/10)



Photo 67. Foundation area for the burned out hoist house for the Jumbo aerial tramway (7/28/10)

As noted in the Erdman and Kauffman report (IGS 2001), an unnamed open shaft exists on USFS administered lands at Lat. 45.56344° N and Long. 115.68771° W. Because of its location along the road to and in proximity of the USFS campground at Jumbo Camp, this hazard should be closed as it is a very dangerous opening particularly for ORVs and snowmobile riders (see photo below).

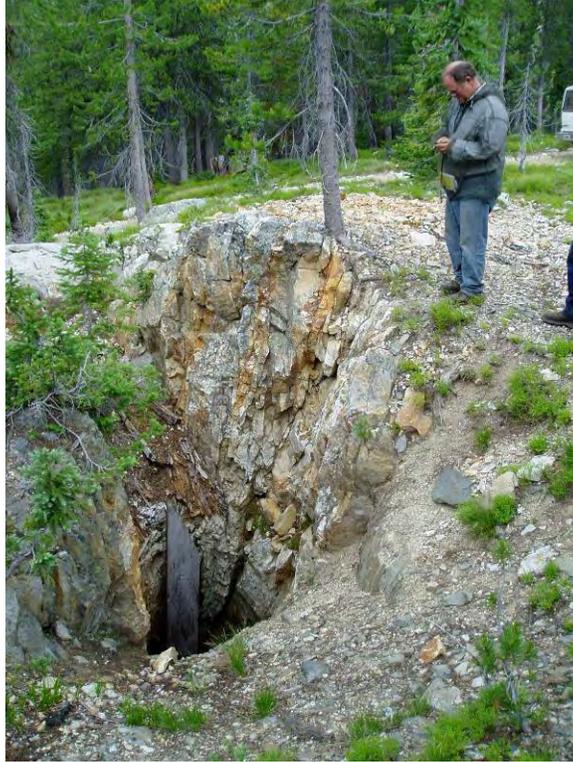


Photo 68. Unnamed open shaft near the Jumbo Mine and Jumbo Camp (7/28/10)



Photo 69. Sample location for JCSW1 and JCSD1 on the West Fork of Jumbo Creek just below Jumbo Camp (7/28/10)

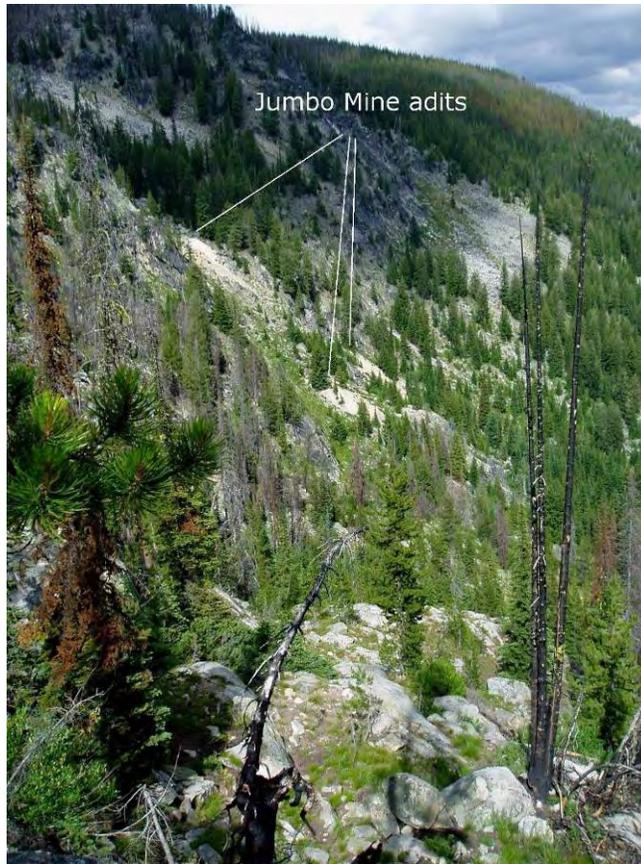


Photo 70. Looking eastward at Jumbo Mine adits (7/29/10)

Assuming the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited observations and assumptions made regarding the site, DEQ is recommending the Jumbo Mine and Mill be designated as NRAP.

8.18 Del Rio Mine and Mill (aka Venture Mine)

The Del Rio Mine is located on unpatented mining claims across the Jumbo Creek canyon from the Jumbo Mine at Lat. 45.55621° N, Long. 115.68153° W.



Photo 71. Looking down on the Del Rio Mine and Mill site from the Jumbo aerial tramway hoist house (7/28/10)

Although DEQ did not visit the mine site, Erdman and Kauffman of the IGS apparently did visit the site in 2000 and wrote the following observations about the Del Rio in “*Site Inspection Report for Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands – Nez Perce National Forest*” (IGS 2001).

Although there are patented claims nearby, the mine is on Forest Service land. The mill may be partly on patented land.

The Del Rio is in biotite granodiorite that has large xenoliths of black schist. The vein strikes north-south to N 25° E and dips about 75° SE. It may be a continuation of the Jumbo Vein. Ore minerals in the gold bearing quartz vein include pyrite, galena, chalcopyrite, covellite and molybdenite (Shenon and Reed 1934)

This site consists of one collapsed adit with a large dump and collapsed mill building. A trough on the slope marks the location of the caved adit.... Water is discharging from the adit at a rate of 2 -3 gallons per minute forms a large iron stained swampy area on top of the dump, then drains around the southern edge of the dump. The dump has several lobes, but overall it measures 100 feet long, 30 feet wide and 20 feet thick.

The mill building, just below the waste dump, is large and completely collapsed. A substantial amount of corrugated sheet metal, scrap metal and machinery is scattered around the site. In the northwestern part of the mill, is a small area of what appears to be mill tailings.

Erdman and Kauffman pulled and analyzed samples of mill tailings and mine effluent. In their analysis they found:

Compared to expected background and environmental levels, Sample E8179909 from the tailings in the mill building contains elevated levels of arsenic, cadmium, copper, and lead in the element screen. No metals of concern are leaching from the sample in the TCLP for metals test.

Sample E8179907 from the Del Rio Adit exceeds the Secondary MCLs for iron and manganese in dissolved metals screen. In total recoverable metals screen, iron exceeds Secondary MCLs and Aquatic Life Acute standard, and manganese exceeds the Secondary MCL. In the EPA 200.8 test, lead is within range of the Aquatic Life Chronic standard.

IGS did not analyze the water quality sample for total aluminum, arsenic, cadmium, chromium, copper, or mercury. This analytical information provided by Erdman and Kaufmann does not indicate any serious ecological or human health risks. Therefore, based on the limited observations and assumptions made regarding the site DEQ is recommending the Del Rio Mine and Mill be designated as NRAP.

8.19 Dewey Occurrence

The Dewey Occurrence consists of at least two patented mining claims that have been subdivided into numerous parcels. Generally speaking it is approximately 600 feet wide from east to west and 3200 feet from north to south. A caved adit and waste dump exist almost dead center in the claims block at Lat. 45.57361° N, Long. 115.68764° W.

The Dewey Occurrence has numerous recreational homes and shacks located along the USFS road that traverses the Buffalo Hump Mining District. These residences are the only significant features of this claims block. The legal parcels and plats for the subdivision of the Dewey Occurrence have not been delineated for this assessment.



Photo 72. Recreational residence on the Dewey Occurrence (7/29/10)



Photo 73. View looking down into Jumbo Camp from the northernmost claim of the Dewey Occurrence (7/28/10)

DEQ did not collect any soil or water samples. However, assuming the geology and ore mineralogy are similar to those sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, based on the limited

observations and assumptions made regarding the site, DEQ is recommending the Dewey Occurrence be designated as NRAP.

8.20 Sheep Creek Placers

The Sheep Creek Placers is a very large block of patented placer ground approximately 140 acres in size. For location purposes of this project Lat. 45.59570° N, Long. 115.69238° W describe the approximate location of where the placer claims boundary crosses the upstream most segment of the East Fork of Sheep Creek below Frogtown, from there the claims extend about 4500 feet downstream.



Photo 74. Meadows on Sheep Creek Placer (7/27/10)

Like most of the perennial streams flowing in the Buffalo Hump Mining District, Sheep Creek is the fall line for lush high alpine meadows and wetlands. However, there were no signs of stress in these floral communities due to historic mining activities.



Photo 75. Lower Sheep Creek sediment and surface water sampling site below the Sheep Creek Placers (7/27/10)



Photo 76. Along the way down Sheep Creek from the Concord Mine DEQ located a small rock shelter constructed for a hunting blind (7/27/10)

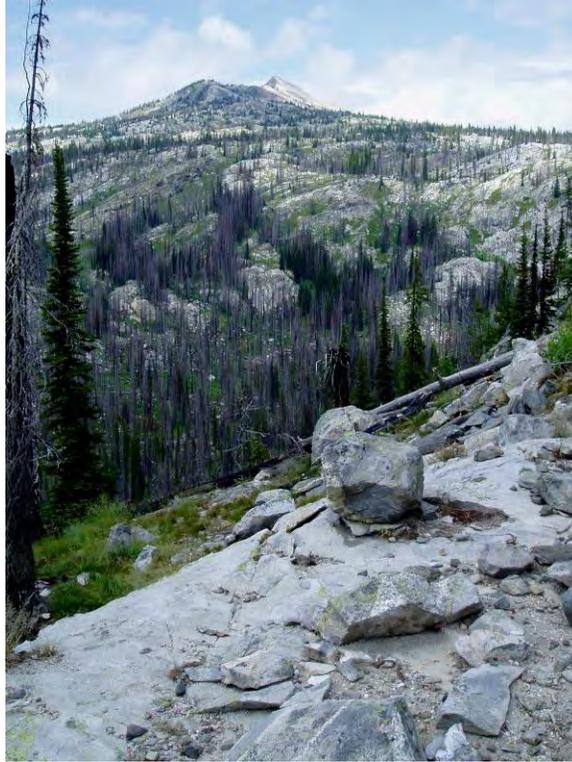


Photo 77. Humptown site and the headwaters of Sheep Creek are located on the southern flank of the Buffalo Hump Mining District (7/27/10)

DEQ collected soil and water samples to evaluate the cumulative effects of mining on Sheep Creek. Based on this data and assumptions the geology and ore mineralogy are similar to sites sampled in the Buffalo Hump Mining District, it is unlikely significant human health or ecological risks exist at this site. Therefore, DEQ is recommending the Sheep Creek Placers be designated as NRAP.

Section 9. Sample Collection and Analysis

9.1 Collection

A total of 11 samples were collected from the Buffalo Hump Mining District:

- Soil/Mine Waste – 1 sample
- Soil – 1 sample
- Sediment – 4 samples
- Water – 5 samples*

*The St. Louis Mine sample was taken from water flowing out of the adit. This may be considered a ground water sample.

Sample locations are shown on Figure 8.

The soil and sediment samples were sieved at the sample location, placed in a properly marked plastic zip lock bag and then placed in a similarly marked cloth bag, and entered into the Chain-of-Custody form prior to shipping to Silver Valley Laboratories, Inc. (SVL). The portion of the sample that passed through a 9 mesh sieve was sent for laboratory analysis.

After the samples were bagged and tagged, Nitrile gloves and disposable plastic spoons were discarded into a sealable waste bag. The screens used to sieve and collect samples were washed and scrubbed with Alconox and thoroughly rinsed with distilled water and then dried with paper towels. The sieves were then stored in a clean, isolated container for transportation to the next sample location.

Prior to collection of field parameters for water quality analysis, laboratory prepared sample bottles were labeled and triple rinsed by a gloved technician who then filled the bottles as grab samples. The bottled were acidified with 10 ml nitric acid, closed, dried, and placed in a cooler with ice.

Once the water samples were collected, a technician used a Horiba to collect field parameters (pH, conductivity, turbidity, dissolved oxygen, temperature and salinity) from an undisturbed site slightly upgradient from where the water sample was collected. Subsequent to collection of field parameters, the probe for the Horiba was rinsed in distilled water and recalibrated for each new site. Please note water quality field parameters were not collected for Sheep Creek. The site assessment crew was split into two groups and only one Horiba was available.

The soil and surface water samples were submitted in accordance with EPA Chain-of-Custody procedures to SVL in Kellogg, Idaho for analysis of RCRA 8 Suite + copper and zinc. A copy of the laboratory report is included as Appendix A. A summary of the laboratory results is included in Tables 2 through 4.

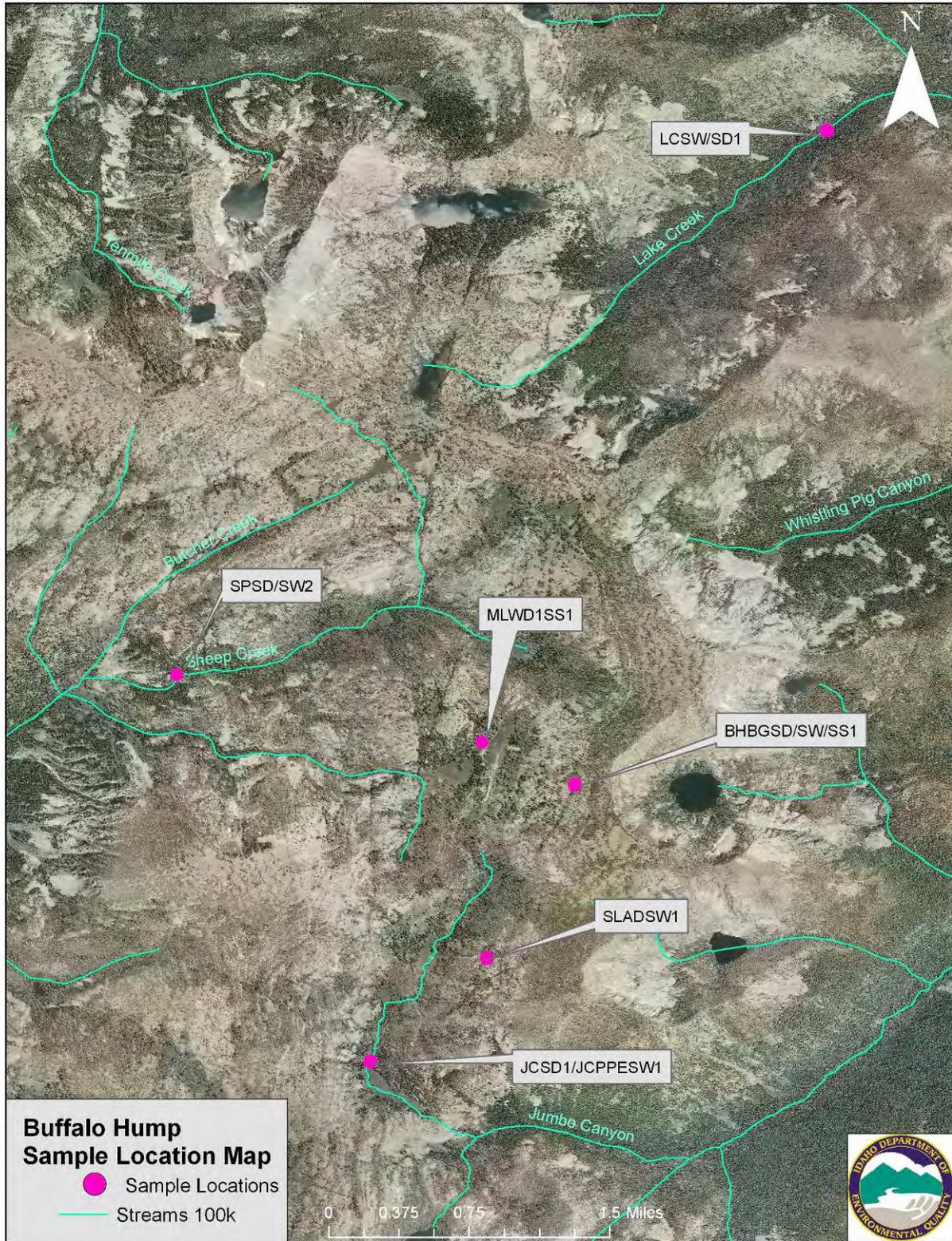


Figure 8. Sample Locations in the Buffalo Hump Mining District (Map Source: Idaho DEQ GIS ArcSDE 9.2 Geodatabase; Digital Orthoimagery Series of Idaho (2009, 1-Meter, Natural Color))

Table 2. Soil, Sediment, and Waste Sample Analysis

Buffalo Hump Mining District

Metals	IDTLs (mg/kg)	HHSLs (mg/kg)	Buffalo Hump Background Sediment Sample BHBGSD1 (mg/kg)	Buffalo Hump Background Soil Sample BHBGSS1 (mg/kg)	Lake Creek Sediment Sample 1 LCSD1 (mg/kg)	Sheep Creek Placer Sediment Sample 1 SPSD2 (mg/kg)	Jumbo Creek Sediment Sample 1 JCSD1 (mg/kg)	Mother Lode Waste Dump Soil Sample 1 MLWD1SS1 (mg/kg)
Antimony	4.77	31	<2.0	<2.0	<2.0	3	<2.0	19.1
Arsenic	0.391	23	<2.5	<2.5	2.7	2.7	<2.5	12.8
Barium	896	1600	12.8	31.3	20	26.2	16.4	58.6
Cadmium	1.35	39	<0.20	<0.20	<0.20	<0.20	<0.20	1.04
Chromium	7.9	210	13.9	12.5	3.73	9.1	6.38	<0.60
Copper	921	2900	8.41	9.08	6.07	10.3	3.53	54
Iron		55000	8620	9230	4040	6030	5190	4320
Lead	49.6	400	2.07	6.54	12.6	33.6	6.69	311
Manganese	223	3600	276	258	204	103	74.1	33.2
Selenium	2.03	23	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Silver	0.189	390	<0.50	0.55	2.78	2.4	<0.50	9.56
Zinc	886	390	16.2	23.2	16.5	35.6	10.3	55.4
Mercury	0.00509	23	0.035	<0.033	0.088	0.528	0.052	3.18

BOLD = metals concentrations in soils exceed the BLM Ecological Risk Benchmarks.

Orange = exceeds Idaho Initial Default Target Levels (ITDLs).

Yellow = exceeds Human Health Screening Levels (HHSLs).

Larger Font Size = exceeds Background Levels by greater than three times.

**Table 3. Wildlife and Livestock Risk Management Criteria for Metals in Soils (mg/kg)
BLM Technical Note 390 Rev. “Risk Management Criteria for Metals at BLM Mining Sites”**

Buffalo Hump Mining District

Metals	Elk	Mule Deer	Big Horn Sheep	Deer Mice	Cottontail Rabbits	Canada Goose	Mallard	Robin	Cattle	Sheep	Median Values
Antimony											
Arsenic	328	200	387	230	438	61	116	4	419	275	275
Barium											
Cadmium	3	3	9	7	6	2	1	0.3	15	12	8
Chromium											
Copper	131	102	64	640	358	161	141	7	413	136	136
Iron											
Lead	127	106	152	142	172	34	59	6	244	125	125
Manganese											
Selenium											
Silver											
Zinc	275	222	369	419	373	271	196	43	1082	545	307
Mercury	11	11	6	2	15	6	4	1	45	8	8

Table 4. Total Recoverable Metals Analysis (mg/L)

(Concentrations expressed in mg/l unless otherwise stated)

Buffalo Hump Mining District

Description	DEQ Ground Water Standard	DEQ Drinking Water Standard	DEQ Cold Water Biota Standard	DEQ Cold Water Biota Standard	Buffalo Hump Background Surface Water Sample 1	St. Louis Adit Surface Water Sample 1	Lake Creek Water Sample 1	Sheep Creek Placer Surface Water Sample 1	Jumbo Creek PPE Surface Water Sample 1
	(T)	MCL	Acute	Chronic	BHBGSW1	SLADSW1	LCSW1	SPSW2	JCPPESW1
Antimony					<0.020	<0.020	<0.020	<0.020	<0.020
Arsenic	0.05	0.01	0.36	0.19	<0.025	<0.025	<0.025	<0.025	<0.025
Barium	2	2			0.0157	0.0126	0.0032	0.0051	0.0055
Cadmium	0.005	0.005	0.00082 (H)	0.00037 (H)	<0.0020	0.0033	<0.0020	0.0032	<0.0020
Chromium (Total)	0.1	0.1			<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Copper	1.3		0.0046 (H)	0.0035 (H)	<0.010	0.047	<0.010	<0.010	<0.010
Iron	0.3*				0.762	1.54	<0.060	1.05	<0.060
Lead	0.015	0.015	0.014 (H)	0.00054 (H)	<0.0075	0.268	<0.0075	<0.0075	<0.0075
Manganese	0.05				0.0494	0.343	<0.0040	0.663	<0.0040
Selenium	0.05	0.05	0.018 (T)	0.005 (T)	<0.040	<0.040	<0.040	<0.040	<0.040
Silver	0.1*		0.00032 (H)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zinc	5*		0.035 (H)	0.032 (H)	<0.0100	0.0896	<0.0100	<0.0100	<0.0100
pH				6.5 - 9.0	6.42 su	6.54 su	6.35 su	Not Taken	6.70 su
Conductivity					0.012 µs/cm	0.13 µs/cm	0.02 µs/cm	Not Taken	0.037 µs/cm
Turbidity				Not >50 NTU instantaneous and not >25 NTU over a 10 day period	<16 NTU	<27 NTU	<30 NTU	Not Taken	<1 NTU
Dissolved Oxygen				>6	9.70	11.96	4.7	Not Taken	12.27
Temperature				Cold water aquatic life 22°C or less or a maximum daily average not >19°C Salmonid spawning 13°C or less with a maximum daily average not >9°C	8.8° C	5.4°C	10.2°C	Not Taken	7.7°C
Salinity					0.0	0.0	0.0	Not Taken	0.0

* secondary MCL (T) – Standard in Total (H) – Hardness dependent * 25 mg/L

Bold = Exceeds cold water biota.

Yellow = Exceeds Background Levels by greater than three times.

9.2 Soils Analysis

Soil samples were analyzed at SVL utilizing EPA 6000/7000 method 6010B for all metals except mercury where method 7471A was utilized. Laboratory analytical results have been compared to and will be discussed below relative to Idaho's *Initial Default Target Levels* (IDTLs), EPA Region 6 Human Health Medium-Specific Screening Levels (HHSLs), and the U.S. Department of Interior-Bureau of Land Management Wildlife and Livestock Risk Management Criteria for Metals in Soils (Technical Note 390 Rev.2004).

The IDTLs are risk-based target levels for certain chemicals that have been developed by DEQ using conservative input parameters, a target acceptable risk of 10^{-5} , and a *Hazard Quotient* of 1. These numbers, although used for comparison even at remote locations, are more applicable to sites where "unrestricted uses" such as residential development are expected. Similarly, the EPA Region 6 HHSLs are human health based risk derived for screening where residents are at risk for exposure. These concentrations are not unusual for a location or facility in a historic mining district such as the Buffalo Hump area.

Background Soil and Waste Dump Samples

The background soil sample (BHBGSS1) was collected uphill from the airstrip approximately 400 yards. This site is above the Concord Mine. The sample was a composite from numerous scattered locations. The sample exceeded the IDTLs for chromium by 1.58 times, for manganese by 1.16 times, and for silver by 2.9 times. The sample did not exceed any of the HHSLs parameters or the BLM Ecological Risk Benchmarks. Metals concentrations in the background sample were unremarkable and given the remoteness of the site and its current uses, no human health or ecological risks are evident.

Mother Lode Mill Site Waste

The waste sample (MLWD1SS1) was collected from the mill tailings found at the Mother Lode Mill site. Numerous samples were collected and then composited. The waste was primarily country rock with any ore bearing material long since removed. The waste dump size was approximately 2,000 cubic yards of material.

Sample MLWD1SS1 from the Mother Lode waste dump exceeded the BLM ecological risk median benchmark for lead by 2.48 times. Antimony, cadmium, copper, lead, silver, and mercury exceeded the background soil sample by greater than three times. These values being 4.0, 0.77, 6.4, 6.27, 19.1, and 90.8 times, respectively. The IDTLs for antimony, arsenic, lead, silver and mercury were exceeded. These values being 4.0, 32.7, 6.3, 50.6, and 624.75 times, respectively. Although mercury in the waste dump exceeded the BLM Risk Benchmark, the background soil sample, and the IDTLs, the values did not exceed the HHSLs.

The existing access to the waste dump is restricted. Provided access remains restricted, this area does not pose a substantial risk to the general public. Although there are no permanent residents on or immediately adjacent to the site, a mine site safety and health plan should address how to prevent or minimize human exposures to the dump site. A further restriction, such as fencing off

the dump site, is recommended. Should the mine ever be reopened, the mine site safety and health plan should address how to prevent or minimize worker and part time resident exposures at this waste dump.

9.3 Sediment Analysis

Background Sediment

One background sediment sample (BHBGSD1) was collected from the bed of a small flowing creek in the same general location as the soil sample, approximately 400 yards above the airstrip and the Concord Mine. The sample exceeded the IDTLs for chromium by 1.76 times, for manganese by 1.23 times, and for mercury by 5.93 times. Metals concentrations in the background sample were unremarkable except for mercury which exceeded IDTLs. Nevertheless, given the remoteness of the site and its current uses, no human health or ecological risks are evident.

Lake Creek/USFS Campground

A sediment sample (LCSD1) was collected at the USFS campground approximately 1-¼ miles downstream of the old Calendar town site. There are several placer claims below this sample site which have no indications of any historical major workings. The sample exceeded the IDTLs levels for arsenic by 6.9 times, for silver by 14.7 times, and for mercury by 14.9 times. Lead exceeded the background level by six times and silver exceeded the background level by 14.7 times. These metal levels are not significantly high, thus no human health or ecological risks are evident.

When evaluated alongside of water quality samples it does not appear dissolved metals are mobile in the water column. Therefore, this pathway to aquatic communities and for exposures through primary and secondary contact recreation is incomplete. However, where some sediment may be derived within the USFS property, some additional sampling of the soils in that area may be warranted.

Sheep Creek Placer

One sediment sample was collected at the downstream end of the claim. Sample SPSD2 exceeded the IDTLs levels for arsenic by 6.9 times, chromium by 1.15 times, silver by 12.69 times, and mercury by 103.7 times. Lead exceeded the background level by 16.23 times and mercury exceeded the background level by 15.0 times. Although metals concentrations exceed the IDTLs and the background, it is very unlikely, due to the remoteness (relative to humans) and inaccessibility, any human health risks are associated with this mine site.

Jumbo Creek PPE Sediment

A sediment sample (JCSD1) was collected upstream of the Jumbo and Del Rio Mines near the Jumbo campsite. This sample location was considered a probable point of entry (PPE) sample. The sample exceeded the IDTLs levels for mercury by 8.81 times. Lead exceeded the background level by 3.23 times. Although two metals concentrations exceed the IDTLs and the

background level, these levels were unremarkable and it is very unlikely any human health risks are associated with this mine site.

9.4 Water Quality Sample Analysis

There is significant interaction between surface and ground water systems, with the latter being more influent on the former. However, as discussed below, field parameters and laboratory analyses indicate, although metals are present locally, buffering capacity in host rocks and in the water column stifles migration of metals through the local surface and ground water systems.

Background Water

One background water sample (BHBGSW1) was collected from a small flowing creek in the same general location as the soil and sediment samples, approximately 400 yards above the airstrip and the Concord Mine. With the exception of iron and manganese, all water chemistry parameters were below the laboratory detection limit. Compared to the Idaho Ground Water Standard, iron was 2.54 times the standard while manganese was below the standard. These metal levels are unremarkable and it is very unlikely that any human health risks are associated with this area. Field parameters measured at the site and laboratory analysis were unremarkable.

St. Louis Adit Surface/Ground Water

A surface/ground water sample (SLADSW1) was collected from the water flowing from the mine adit. The flow was less than 2 gpm. The sample exceeded the DEQ Acute Cold Water Biota Standard for cadmium by 4.0 times and copper by 10.2 times. The sample exceeded the DEQ Ground Water Standard for iron by 5.1 times, lead by 17.8 times, and manganese by 6.86 times. Although metals concentrations exceeded the DEQ Acute Cold Water Standard and Ground Water Standard, it is very unlikely any human health risks are associated with this mine site. Field parameters measured at the site and laboratory analysis were unremarkable.

Lake Creek Surface Water

A surface water sample (LCSW1) was collected at the USFS campground downstream of the old Calendar town site. There are several placer claims below this sample site which have no indications of any historical major workings. All water chemistry results for this sample were below the laboratory detection limit.

When evaluated alongside of water quality samples, it does not appear dissolved metals are mobile in the water column. Therefore, this pathway to aquatic communities and for exposures through primary and secondary contact recreation is incomplete.

Field parameters measured at the site and laboratory analysis were unremarkable with the exception of dissolved oxygen which was below the DEQ Cold Water Biota Standard. This concentration is conspicuously low for a free flowing riffle dominated stream and presumably is inaccurate.

Sheep Creek Placer Surface Water

One surface water sample (SPSW2) was collected at the downstream end of the claim. Cadmium exceeded the DEQ Acute and Chronic standards for Cold Water Biota. Iron exceeded the DEQ Ground Water Standard. Manganese exceeded the background levels by three times. The rest of the water chemistry results for sample SPSW2 were below the laboratory detection limit with the exception of barium which was well below any of the standards. This metal level is unremarkable and it is very unlikely any human health risks are associated with this creek either through primary or secondary contact recreation.

The team split into two groups to better utilize our time, only one Horiba water quality field sampling instrument was available. It did not travel with the Sheep Creek group, thus no field parameters were measured in Sheep Creek.

Jumbo Creek Surface Water PPE

A surface water sample (JCPPEW1) was collected upstream of the Jumbo and Del Rio Mines near the Jumbo campsite. All water chemistry results for this sample were below the laboratory detection limit with the exception of barium which was well below any of the standards. When evaluated alongside of water quality samples, it does not appear dissolved metals are mobile in the water column. Therefore, this pathway to aquatic communities and for exposures through primary and secondary contact recreation is incomplete. Field parameters measured at the site and laboratory analysis were unremarkable. It was noted that pH exceeded the DEQ Chronic Cold Water Biota Standard of 6.5-9.0.

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Section 10. Pathways and Environmental Hazards

10.1 Surface Water Pathways

The surface water migration pathway target distance limit (TDL) begins at the PPE of surface water runoff from a site to a surface water body and extends downstream for 15 miles. The surface water TDL for the Buffalo Hump Mining District is presented in Figure 9.

The PPE starts on Jumbo Creek sampling site JCPPEW1. Jumbo Creek is a tributary to Lake Creek, which is a tributary to Crooked Creek, which is a tributary to the Main Salmon River. There are no cabins or homes within 15 miles downstream of the PPE. Surface water pathways are not complete for the 15 mile radius.

10.2 Ground Water Pathways

In areas where historic mines are located in proximity to residential areas contamination of drinking water systems may come from two types of mine sources (ore bodies and waste dumps) and along three pathways, as illustrated by the following three scenarios. First, heavy metals leach from tailings piles and waste rock dumps, enter ephemeral or perennial drains, and then contaminate the area's shallow ground water system. Second, heavy metals leach from the local ore bodies and are transported through the geologic structure to the shallow ground water. Third, heavy metals could leach out of the ore bodies, and be discharged from the underground workings as adit water, that is then conveyed through ephemeral and perennial drains to the shallow ground water systems.

10.3 Domestic Wells and Public Water Supplies

There are no domestic wells and no public water system wells or their zones of capture located within the four mile radius of the Buffalo Hump Mining District. The nearest domestic sources are approximately nine miles to the northeast at Orogrande and are segregated from the site by structural geology. The Orogrande area's drainage flows into the South Fork of the Clearwater River while the Buffalo Hump Mining District drainage flows into the Main Salmon River.

The EPA target distance limit of 15 miles from the PPE for surface water was measured from the PPE at Jumbo Creek. The town of Orogrande is in a completely separate drainage. The Dixie town site is approximately 19 miles to the east of the mining district and is segregated from the mining district by structural geology. The Dixie Water Association is a non-regulated water system with fewer than 15 connections and fewer than 25 people utilizing it.

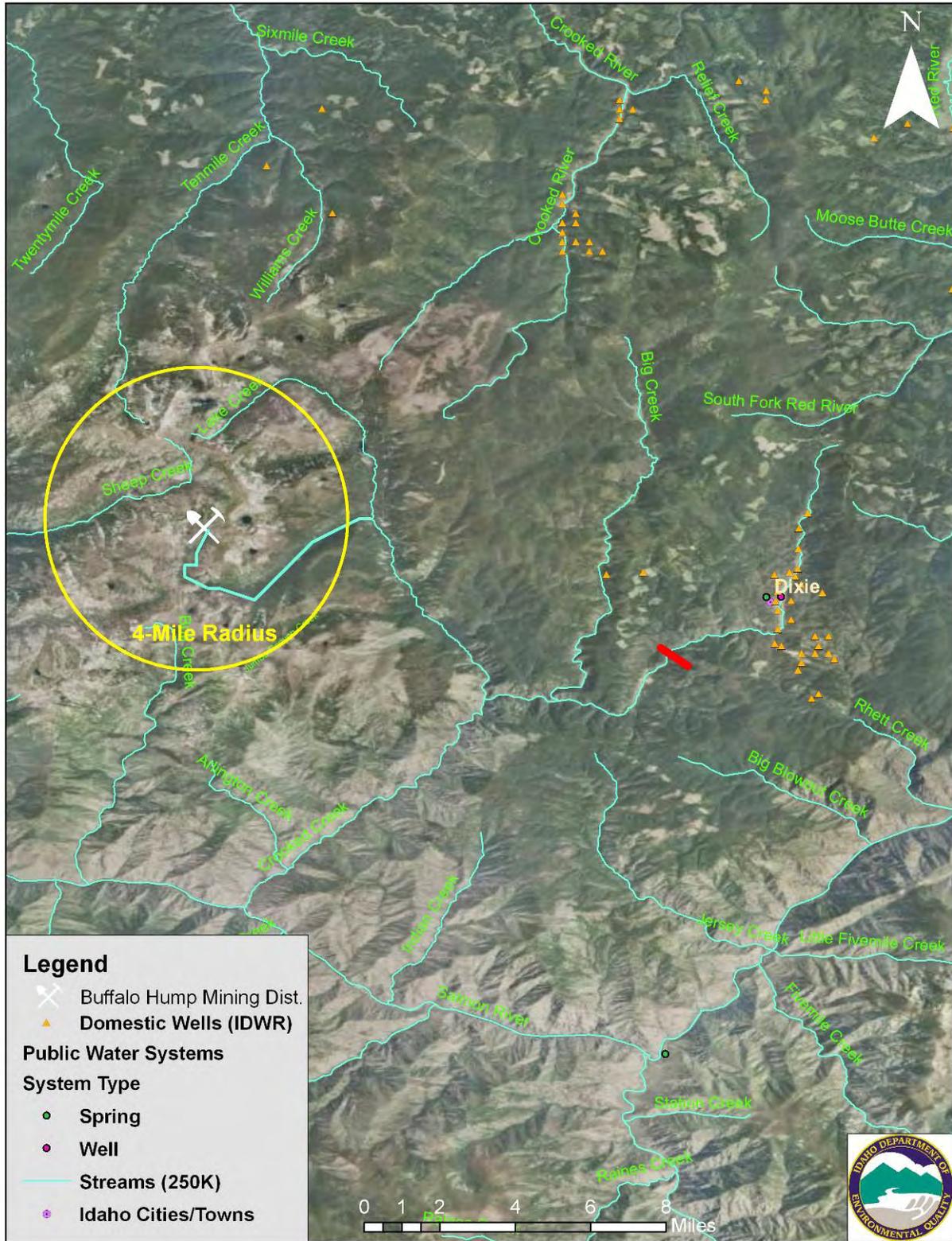


Figure 9. Domestic Wells and Public Water System Wells Located Near Buffalo Hump Mining District 15-Mile Target Distance Limit (TDL) Identified by Red Line on Map (Map Source: Idaho DEQ GIS ArcSDE 9.3.1 Geodatabase; Digital Orthoimagery Series of Idaho (2009, 1-Meter, Natural Color))

The following information was obtained from discussions with Karl Urquhart of Back Country Builders of Grangeville, ID. During the DEQ site inspections Mr. Urquhart was building a cabin and until recently, had his own cabin in the Buffalo Hump Mining District. Unfortunately, the cabin burned down during the 2007 Rattlesnake Fire and he chose not to rebuild. Mr. Urquhart said there are approximately 13 recreational/seasonal cabins located within the Buffalo Hump Mining District. He said all the cabins utilize springs for their domestic water supply. No springs were located adjacent to, below, or down gradient of any mine waste pile, tunnels, or disturbed areas (Karl Urquhart, *pers. comm.*). Thus, no direct surface water pathways exist from mining activities to these water sources.

However, ground water/springs utilized for potable water could be influenced by mining related disturbances and natural background metals concentrations. DEQ recommends individuals utilizing springs as domestic drinking water in the Buffalo Hump Mining District have their water analyzed for potential hazards.

10.4 Air Quality Pathways

The air quality pathways are not complete. The Buffalo Hump Mining District is not easily accessible. As previously mentioned, the largest waste dump of approximately 2,000 cubic yards located at the Mother Lode Mill site, has restricted access. With the exception of the Big Buffalo Mine, which was last in operation in the mid 1980's, these mines have sat idle for 50 plus years. All waste sites and previously disturbed sites are stable and the potential to deliver significant dust to casual recreationists, hunters, or cabin owners is very minimal.

The venture partners of the Big Buffalo Mine intend to reopen the mine in 2011. DEQ was not granted permission to do a site inspection of the mine. Therefore, no soil or water chemical analysis was done. DEQ makes the assumption the soil and water analysis would be similar to the mines in the district that were sampled.

Mine workers at the Big Buffalo Mine are likely to receive appreciable exposures via air pathways. These air pathways would be complete. Although this is an inherent risk of the job, a mine site safety and health plan required by the MSHA should account for management of these risks.

10.5 Soil Exposures

According to DEQ's Risk Evaluation Manual, if pathways are determined to be "complete" or if pathways are anticipated to become complete as a result of future uses, and the IDTLs are exceeded for any constituents, two options should be considered:

1. Adopt the IDTLs as the cleanup levels and develop a *Risk Management Plan* (RMP).
2. Perform a more detailed, site-specific evaluation, which includes developing site-specific background concentrations for comparative purposes.

The soil exposure pathways are not complete. No permanent residents presently live in the Buffalo Hump Mining District. Human use in the area is restricted to seasonal cabin owners, recreationists, and hunters with casual use at best, thus soil pathways are incomplete for these users. During DEQ's inspection, none of the cabins in the mining district were occupied. The largest waste dump located at the Mother Lode Mine has restricted access and no cabin or camping area adjacent to the waste dump.

The venture partners of the Big Buffalo Mine intend to reopen the mine in 2011. DEQ was not granted permission to do a site inspection of this mine. Therefore, no soil or water chemical analysis was done. DEQ makes the assumption the soil and water analysis would be similar to the mines in the district that were sampled. Mine workers at the Big Buffalo Mine are likely to receive appreciable exposures via soil pathways. These soil pathways would be complete. Although this is an inherent risk of the job, a mine site safety and health plan required by the MSHA should account for management of these risks.

10.6 Residences, Schools, and Day Care Facilities

The nearest potential permanent residents are approximately seven miles away in Orogrande. Orogrande is separated from the Buffalo Hump Mining District by structural geology. Orogrande also is situated in a completely different drainage than the mining district. There are no schools or day care facilities in Orogrande.

10.7 Wetlands

There are many acres of wetlands (Figure 10) in the areas around Jumbo Camp, Concord, and Frogtown, but none of them appear to be directly connected to any waste dumps nor adversely impacted by the historic mine developments.

10.8 Sensitive Species (Plant and Animal)

Most of the sensitive species have huge ranges which overlap onto the Buffalo Hump Mining District. Due to the size of those ranges, these species may not receive significant exposure time or doses to heavy metals. However, the sediment and soils pathways are complete at or adjacent to the St. Louis Mine and Mill site, Sheep Creek Placer, Jumbo Mine and Mill, and Mother Lode waste dump and mill. It is presumed these pathways would be complete for all other mines, mills, and dump sites in the mining district.

Three rare or sensitive plant species are documented to exist within the 4-mile radius of the Buffalo Hump Mining District. (Figure 11). These plants are listed as no status.

Rare or sensitive plants include:

- Tall Swamp Onion (*Allium validum*)
- Idaho douglasia (*Douglasia idahoensis*)
- Candystick (*Allotropa virgata*)

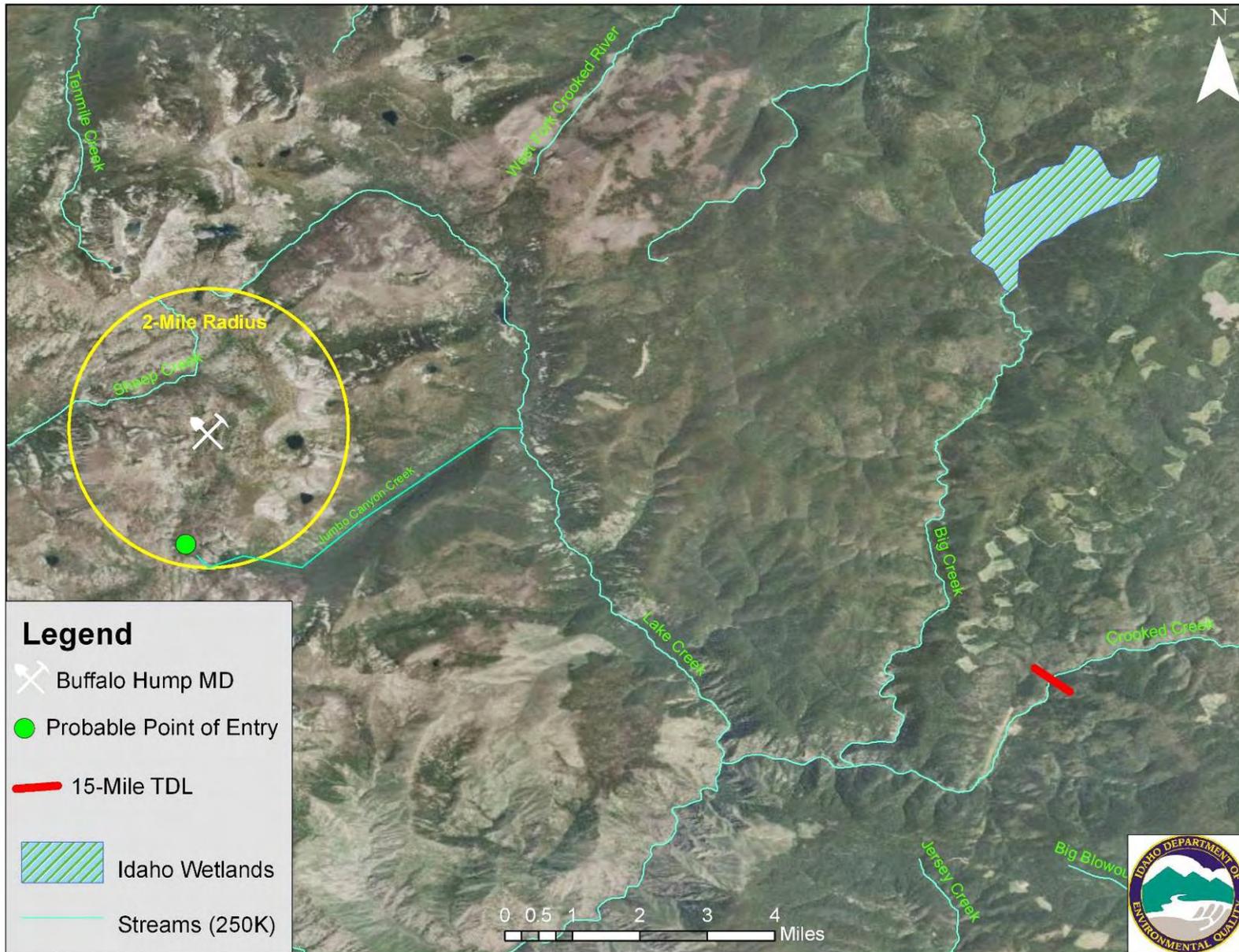


Figure 10. Wetlands Located by 2-Mile Radius of the Buffalo Hump Mining District and 15-Mile Target Distance Limit (TDL) (Map Source: Idaho DEQ GIS ArcSDE 9.3.1 Geodatabase; Digital Orthoimagery Series of Idaho (2009, 1-Meter, Natural Color))

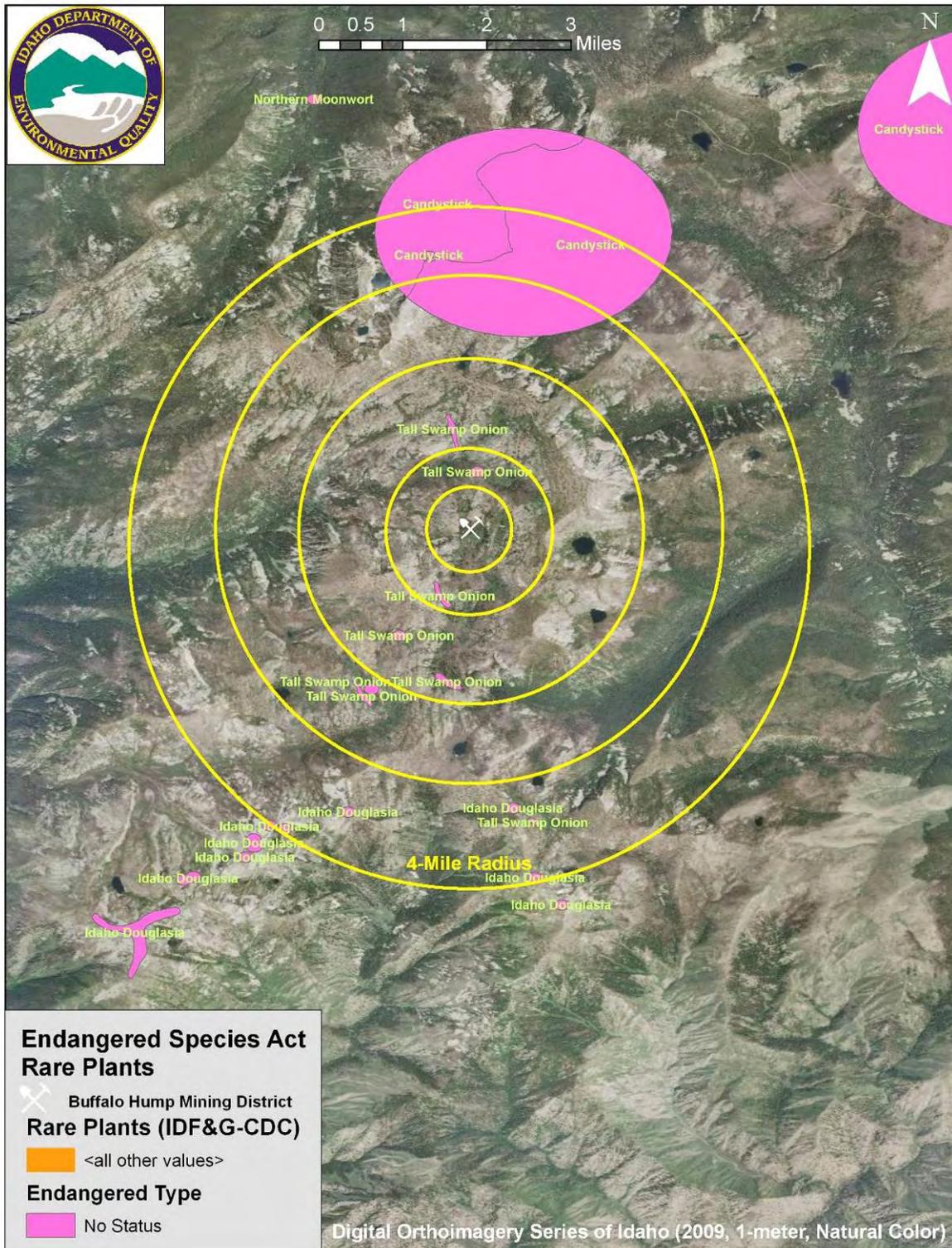


Figure 11. Sensitive Species In and Around the Buffalo Hump Mining District; Species of Concern (Plants) (Map Source: SDE Feature Dataset, Animal Conservation Database; Idaho DEQ GIS ArcSDE 9.2 Geodatabase; Digital Orthoimagery Series of Idaho (2009, 1-Meter, Natural Color))

Ten-non game animals are listed within the 4-mile radius of the Buffalo Hump Mining District. These animals are listed as “species of concern” and have no status. However, the size of the tailings impoundments relative to the total range is very small and, therefore, unlikely to be a significant source for exposure (Figure 12).

Animal Species of Concern include:

Gray wolf (*Canis lupus*)
North American wolverine (*Gulo gulo luscus*)
Long toed salamander (*Ambystoma macrodactylum*)
Red squirrel (*Tamiasciurus hudsonicus*)
American pika (*Ochotona princeps*)
Mountain quail (*Oreortyx pictus*)
Columbian ground squirrel (*Spermophilus columbianus*)
Idaho giant salamander (*Dicmptodon aterrimus*)
Red tailed chipmunk (*sciurus granatensis*)
Grizzly bear (*Ursus arctos horribilis*) threatened via Endangered Species Act

Three species of fish are listed within the 4-mile radius of the Buffalo Hump Mining District (Figure 13). These fish are considered sensitive species and listed as threatened via the Endangered Species Act. This area is classified as “critical habitat” for all three species. The area is also classified as “known occupied” for the bull trout. Results of the water chemistry analysis for the mining district indicate no threat to these fish from mine related discharges.

Threatened fish species and critical habitat include:

Bull trout (*Salvelinus confluentus*)
Chinook salmon (*Oncorhynchus tshawytscha*) (Fall/Spring/Summer runs)
Steelhead (*Oncorhynchus mykiss*)

Buffalo Hump Mining District Stream/Creek Fisheries

DEQ contacted the USFS, Idaho Department of Fish and Game, and the BLM requesting fisheries data for the Buffalo Hump Mining District streams and lakes. Limited information was available as follows.

In 2004 the USFS did a limited fish survey of three streams in the Lake Creek drainage. The USFS collected brook trout and rainbow trout in Jumbo Creek. Silver Spur Creek, a tributary to Lake Creek, approximately six miles downstream from the mining district had brook trout and rainbow trout. Fawn Creek, which is approximately 1.5 miles downstream of Silver Spur Creek, apparently is a fishless stream, with no fish collected. Information from the Nez Perce National Forest Web site indicated brook trout were present in both Jumbo and Lake Creeks.

The Idaho Department of Fish and Game provided the following information. Sampling on July 20, 2006 in Sheep Creek observed steelhead, cutthroat, Chinook parr, bull trout, dace, and whitefish. The location was not identified relative to where on the creek sampling occurred.

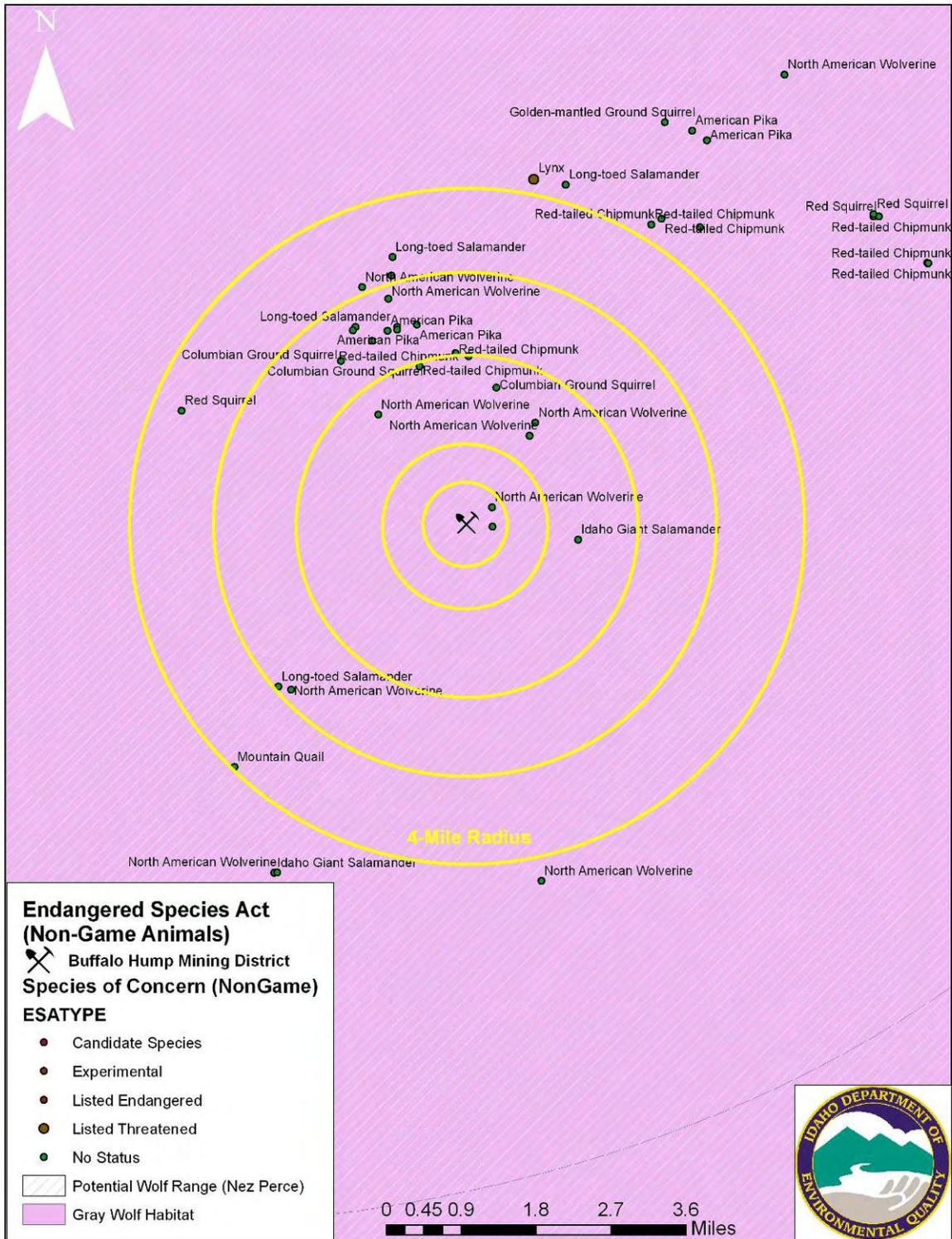


Figure 12. Sensitive Species In and Around the Buffalo Hump Mining District; Species of Concern (Non-Game Animals) (Map Source: SDE Feature Dataset, Animal Conservation Database; Idaho DEQ GIS ArcSDE 9.2 Geodatabase)

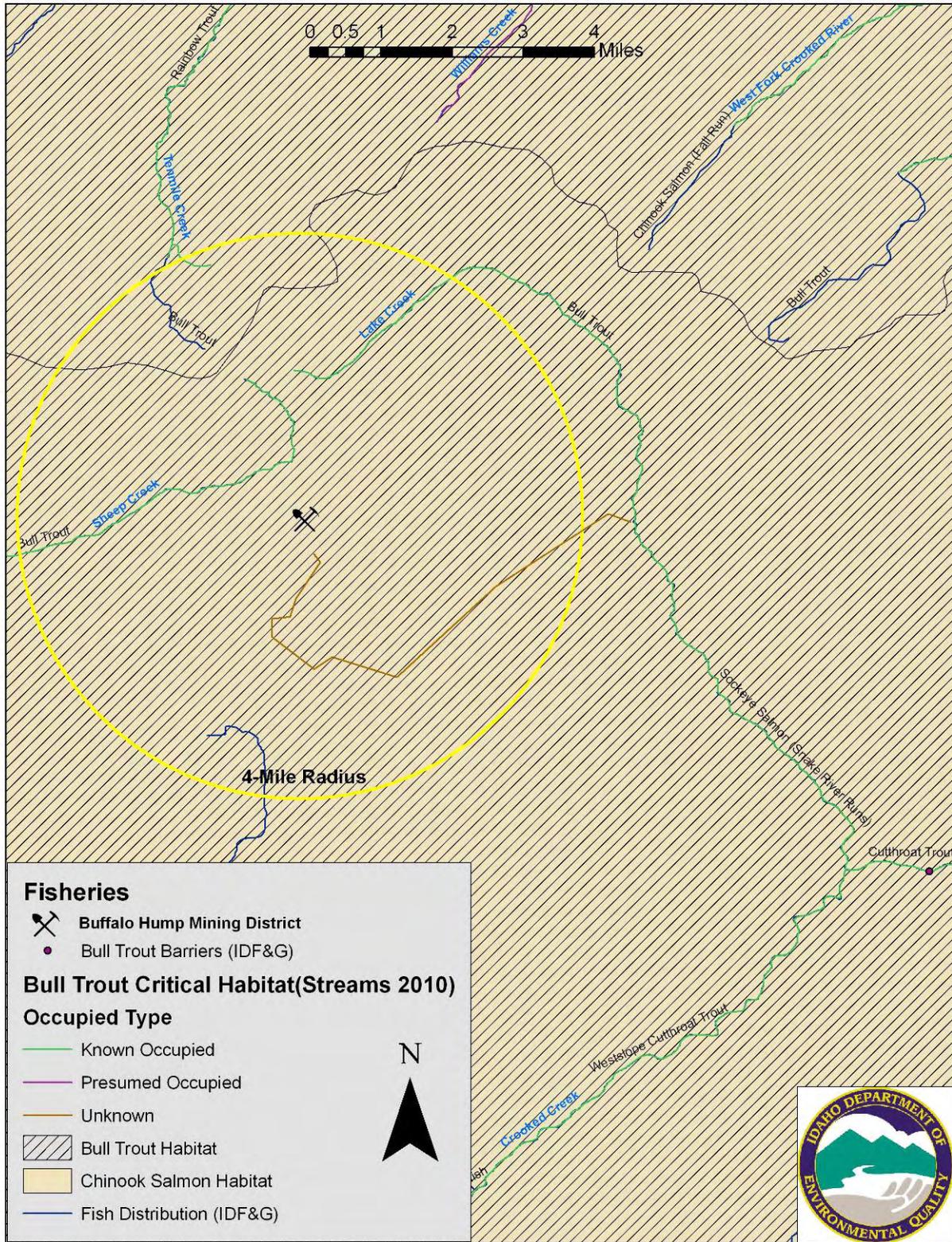


Figure 13. Fisheries Within 4-Mile Radius and Vicinity of the Buffalo Hump Mining District (Map Source: Idaho DEQ GIS ArcSDE 9.3.1 Geodatabase)

According to historic stocking reports, there has been stocking of rainbows and Kamloops rainbows in Crooked Creek as recently as 1997. Stocking began with cutthroat and rainbows in the late 1930's and 1940's. Our surveys in Crooked Creek indicate the presence of steelhead, bull trout, cutthroat, and whitefish in the late 1990's.

DEQ notes Crooked Creek is not in the Buffalo Hump Mining District, but Lake Creek which originates in the mining district is a tributary to Crooked Creek.

Buffalo Hump Mining District Lake Fisheries

The following information was taken from the Gospel Hump Wilderness 1989 Lake Survey Report, September, 1990 by Peter Bahls, High Lake Fisheries Project, Nez Perce National Forest and Idaho Fish and Game.

Please be advised that various different strains of cutthroat were stocked in these high mountain lakes. As an example, the report identifies, cutthroat, Henry's Fork (Yellowstone) cutthroat, two different Westslope hatchery origin cutthroat and some hybridization. For the sake of this report, these fish will be identified only as cutthroat. In addition, Shining, the Wiseboy Lakes, Mirror, Ruby and the Kelly Lakes are not located within the private/federal corridor of land which is excluded from the Gospel-Hump Wilderness.

Bear Lake: Stocking records from 1967 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. Combined numbers for both fish are 17,300 fish stocked during this period. Fish collected by a gill net during the survey were rainbow and cutthroat trout.

Crescent Lake: Stocking records from 1952 thru 1987 indicate cutthroat trout stocked in the lake. Records from 1952 thru 1964 do not indicate the number of individual fish stocked. A total of 9,576 cutthroats are documented as stocked. Fish collected by a gill net during the survey were cutthroat trout.

Crystal Lake: Stocking records from 1966 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. A total of 6,799 fish are documented as stocked. Fish collected by a gill net during the survey were brook trout.

Deer Lake: Stocking records from 1949 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. Records from 1949 thru 1964 do not indicated the number of individual fish stocked. A total of 11,280 fish are documented as stocked. Fish collected by a gill net during the survey were cutthroat trout.

Fawn Lake: Stocking records from 1950 thru 1987 indicate cutthroat trout stocked in the lake. Records from 1950 thru 1963 do not indicated the number of individual fish stocked. A total of 6,922 fish are documented as stocked. Fish collected by a gill net during the survey were cutthroat trout.

Hump Lake: Stocking records from 1965 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. A total of 32,049 fish are documented as stocked. Fish collected by a gill net during the survey were rainbow and cutthroat trout.

Kelly Lake # 1: Stocking records from 1950 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. Records from 1950 thru 1961 do not indicated the number of individual fish stocked. A total of 11,620 fish are documented as stocked. Fish collected by a gill net during the survey were rainbow and cutthroat trout.

Kelly Lake # 2: Stocking records from 1978 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. A total of 3,670 fish are documented as stocked. Fish collected by a gill net during the survey were rainbow trout.

Kelly Lake # 3: No stocking record is indicated and one fish was visually seen with none netted.

Kelly Lake # 4. Stocking records from 1949 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. Records from 1949 thru 1967 do not indicated the number of individual fish stocked. A total of 9,308 fish are documented as stocked. Fish collected by a gill net during the survey were rainbow trout.

Mirror Lake: Stocking records from 1964 thru 1988 indicate rainbow and cutthroat trout stocked in the lake. A total of 17,756 fish are documented as stocked. Fish collected by a gill net during the survey were cutthroat trout.

Round Lake: Stocking records from 1948 thru 1987 indicate rainbow, grayling, and cutthroat trout stocked in the lake. Records from 1948 thru 1958 do not indicated the number of individual fish stocked. A total of 12,316 fish are documented as stocked. Fish collected by a gill net during the survey were cutthroat trout.

Ruby Lake: Stocking records from 1970 indicate grayling stocked in the lake. A total of 5,000 fish are documented as stocked. Fish collected by a gill net during the survey were cutthroat trout.

Shining Lake: Stocking records from 1948 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. Records from 1948 thru 1964 do not indicate the number of individual fish stocked. A total of 15,933 fish are documented as stocked. Fish collected by a gill net during the survey were cutthroat and rainbow trout.

Lower Wiseboy Lake: Stocking records from 1968 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. A total of 10,845 fish are documented as stocked. Fish collected by a gill net during the survey were cutthroat trout.

Upper Wiseboy Lake: Stocking records from 1966 thru 1987 indicate rainbow and cutthroat trout stocked in the lake. A total of 15,090 fish are documented as stocked. Fish collected by a gill net during the survey were cutthroat and rainbow trout.

10.9 Sensitive Waterways

The Clean Water Act (CWA) requires the state to prepare a report, listing (a) the current conditions of all state waters and (b) those waters that are impaired and needing a TMDL (total maximum daily load). The first list is called the 305(b) list and the second is called the 303(d) list. Both lists are named in accordance with the sections of the CWA where they are defined; together they are known as the Integrated Report. Although they are maintained as separate lists and presented separately in the Integrated Report, impaired waters are just some of the state's waters, so water on the 303(d) list is actually a subset of those on the 305(b) list. Figure 14 illustrates the relationship between 303(d) and 305(b) lists.

Crooked Creek is the only waterbody down gradient of the Buffalo Hump Mining District. Crooked Creek was listed on the State of Idaho 303(d) list for impaired waters. Waterbody ID17060207SL068_03, the segment from an unnamed tributary to Big Creek, is listed as not supporting its beneficial uses due to temperature. Waterbody ID17060207SL068_04, the segment from Big Creek to Lake Creek, is listed as fully supporting its beneficial uses. Waterbody ID17060207SL067_05, the segment from Lake Creek to its mouth, is listed as not supporting its beneficial uses due to temperature. Crooked Creek has a completed and EPA approved TMDL document.

10.10 Livestock Receptors

No evidence of livestock being pastured on a long term basis was noted in the Buffalo Hump Mining District. The Concord/Mother Lode site has existing livestock corrals which may be used on a seasonal basis such as during hunting season. Therefore, pathways or exposures for livestock are minimal including those to horses used by packers for hunting and recreation.

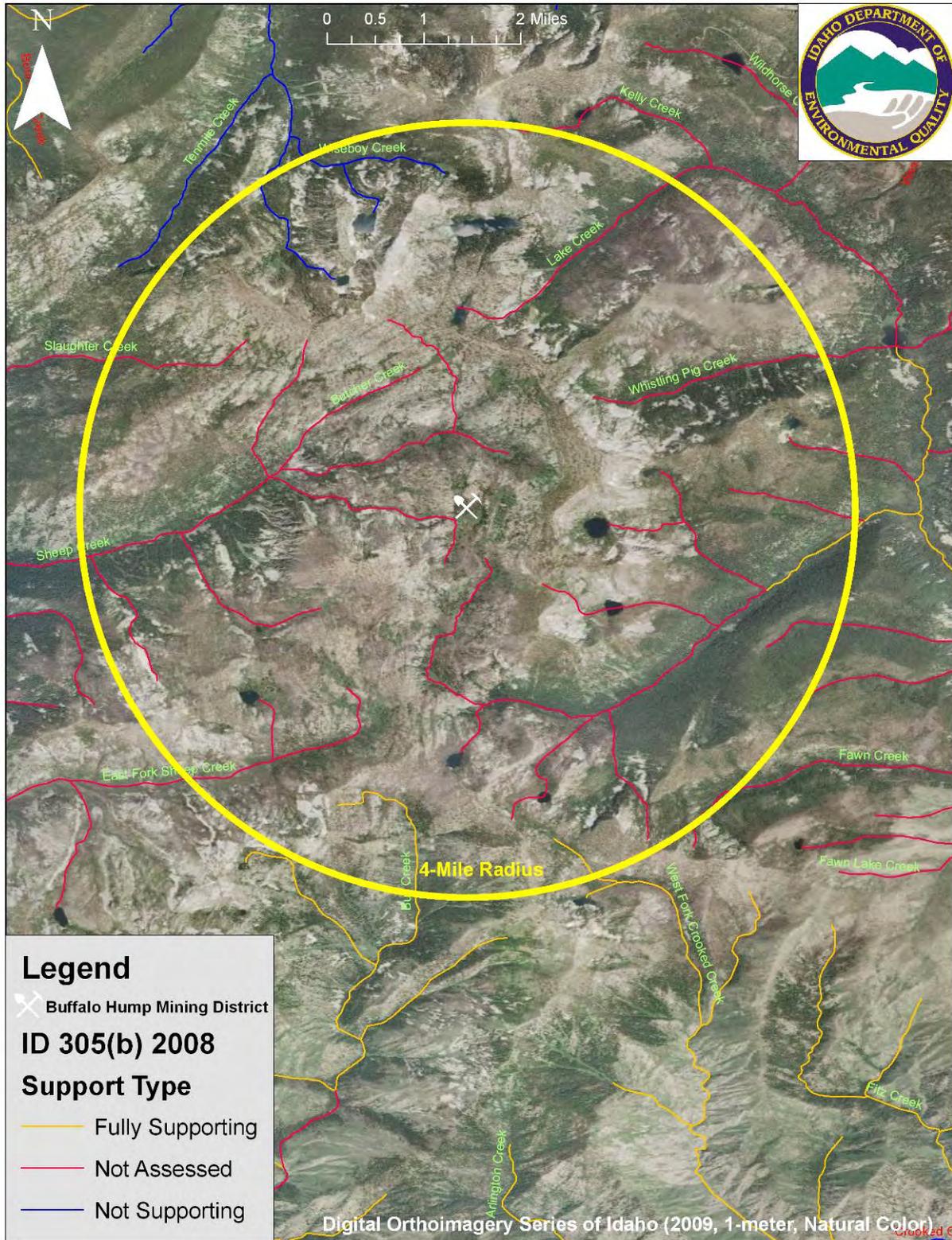


Figure 14. 305(b) Map Sensitive Waterways Within 4-Mile Radius and Vicinity of Buffalo Hump Mining District (Map Source: Idaho DEQ GIS ArcSDE 9.3.1 Geodatabase; Digital Orthoimagery Series of Idaho (2009, 1-Meter, Natural Color))

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Section 11. Summary and Conclusions

Generally speaking toxicological risks to human and ecological receptors are very unlikely in the Buffalo Hump Mining District. This is due to the remoteness, infrequent use of the area, and restricted access. The exception would be if the Big Buffalo Mine reopens, site workers may be at risk of toxic exposures. However, a mine site safety and health plan required by the MSHA should account for management of these risks.

DEQ is recommending EPA classify each of the 20 mine and mill sites and prospects evaluated as No Remedial Action Planned. It should, however, be noted by private property owners, developers, and visitors this recommendation does not consider indirect risks associated with physical hazards. Furthermore, DEQ strongly recommends all domestic drinking water supplies are routinely tested by their owners.

11.1 Soils Analysis

Background Soil Sample (BHBGSS1)

The sample exceeded the IDTLs for chromium by 1.58 times, for manganese by 1.16 times, and for silver by 2.9 times. The sample did not exceed any of the HHSLs parameters or the BLM Ecological Risk Benchmarks. Metals concentrations in the background sample were unremarkable and given the remoteness of the site and its current uses, no human health or ecological risks are evident.

Mother Lode Waste Sample (MLWD1SS1)

Sample MLWD1SS1, from the Mother Lode waste dump, exceeded the BLM ecological risk median benchmark for lead by 2.48 times. Antimony, cadmium, copper, lead, silver, and mercury exceeded the background soil sample by greater than three times. These values being 4.0, 0.77, 6.4, 6.27, 19.1, and 90.8 times, respectively. The IDTLs for antimony, arsenic, lead, silver, and mercury were exceeded. These values being 4.0, 32.7, 6.3, 50.6, and 624.75 times, respectively. Although mercury in the waste dump exceeded the BLM Risk Benchmark, the background soil sample, and the IDTLs, the values did not exceed the HHSLs.

The existing access to the waste dump is restricted. Provided access remains restricted, this area does not pose a substantial risk to the general public. A further restriction, such as fencing off the waste dump site, is recommended.

11.2 Sediment Analysis

Buffalo Hump Background Sediment Sample (BHBGSD1)

The sample exceeded the IDTLs for chromium by 1.76 times, for manganese by 1.23 times, and for mercury by 5.93 times. Metals concentrations in the background sample were unremarkable

except for mercury which exceeded IDTLs. Nevertheless, given the remoteness of the site and its current uses, no human health or ecological risks are evident.

Lake Creek/USFS Campground Sediment Sample (LCSD1)

The sample exceeded the IDTLs for arsenic by 6.9 times, for silver by 14.7 times and for mercury by 14.9 times. Lead exceeded the background level by six times and silver exceeded the background level by 14.7 times. These metal levels are not significantly high, thus no human health or ecological risks are evident. However, where some sediment may be derived within the USFS, some additional sampling of the soils in that area may be warranted.

Sheep Creek Placer Sediment Sample 1 (SPSD2)

This sample was collected at the downstream end of the claim. The sample exceeded the IDTLs for arsenic by 6.9 times, chromium by 1.15 times, silver by 12.69 times and mercury by 103.7 times. Lead exceeded the background level by 16.23 times and mercury exceeded the background level by 15.0 times. Although metals concentrations exceed the IDTLs and the background level, it is very unlikely, due to the remoteness (relative to humans) and inaccessibility, any human health risks are associated with this mine site.

Jumbo Creek PPE Sediment Sample (JCSD1)

This sample was collected upstream of the Jumbo and Del Rio Mines near the Jumbo camp site. This sample is considered a PPE sample. The sample exceeded the IDTLs for mercury by 8.81 times. Lead exceeded the background level by 3.23 times. Although two metals concentrations exceed the IDTLs and the background level, these levels were unremarkable and it is very unlikely any human health risks are associated with this mine site.

11.3 Water Quality Sample Analysis

Buffalo Hump Background Surface Water Sample (BHBGSW1)

With the exception of iron and manganese, all water chemistry parameters were below the laboratory detection limit. Compared to the Idaho Ground Water Standard, iron was 2.54 times the standard while manganese was below the standard. These metal levels are unremarkable and it is very unlikely that any human health risks are associated with this area. Field parameters measured at the site and laboratory analysis were unremarkable.

St. Louis Adit Surface/Ground Water Sample (SLADSW1)

The sample exceeded the DEQ Acute Cold Water Biota Standard for cadmium by 4.0 times and copper by 10.2 times. The sample exceeded the DEQ Ground Water Standard for iron by 5.1 times, lead by 17.8 times, and manganese by 6.86 times. Although metals concentrations exceeded the DEQ Acute Cold Water Standard and Ground Water Standard, it is very unlikely any human health risks are associated with this mine site. Field parameters measured at the site and laboratory analysis were unremarkable.

Lake Creek Surface Water Sample (LCSW1)

A surface water sample (LCSW1) was collected at the USFS campground downstream of the old Calendar town site. There are several placer claims below this sample site which have no indications of any historical major workings. All water chemistry results for this sample were below the laboratory detection limit.

When evaluated alongside of water quality samples it does not appear dissolved metals are mobile in the water column. Therefore, this pathway to aquatic communities and exposures through primary and secondary contact recreation is incomplete.

Field parameters measured at the site and laboratory analysis were unremarkable with the exception of dissolved oxygen which was below the DEQ Cold Water Biota Standard. This concentration is conspicuously low for a free flowing riffle dominated stream and presumably is inaccurate.

Sheep Creek Surface Water Sample 1 (SPSW2)

One surface water sample (SPSW2) was collected at the downstream end of the claim. Cadmium exceeded the DEQ Acute and Chronic standards for Cold Water Biota. Iron exceeded the DEQ Ground Water Standard. Manganese exceeded the background levels by three times. The rest of the water chemistry results for sample SPSW2 were below the laboratory detection limit with the exception of barium which was well below any of the standards. This metal level is unremarkable and it is very unlikely any human health risks are associated with this creek either through primary or secondary contact recreation.

Jumbo Creek PPE Surface Water Sample (JCPPEW1)

All water chemistry results for this sample were below the laboratory detection limit with the exception of barium which was well below any of the standards. When evaluated alongside of water quality samples it does not appear dissolved metals are mobile in the water column. Therefore, this pathway to aquatic communities and exposures through primary and secondary contact recreation is incomplete. Field parameters measured at the site and laboratory analysis were unremarkable. It was noted pH exceeded the DEQ Chronic Cold Water Biota Standard of 6.5-9.0.

11.4 Surface Water Pathways

The surface water migration pathway target distance limit (TDL) begins at the PPE of surface water runoff from a site to a surface water body and extends downstream for 15 miles. There are no cabins or homes within 15 miles downstream of the PPE. Surface water pathways are not complete for the 15 mile radius.

11.5 Domestic Wells and Public Water Supplies

There are no domestic wells and no public water system wells or their zones of capture located within the four mile radius of the Buffalo Hump Mining District. The cabins utilize springs for their domestic water supply. No springs were located adjacent to, below or downgradient of any mine waste pile, tunnels, or disturbed areas. Therefore, no direct surface water pathways exist from mining activities to these water sources.

However, ground water/springs utilized for potable water could be influenced by mining related disturbances. DEQ recommends the individuals utilizing springs as domestic drinking water in the Buffalo Hump Mining District have their water analyzed for potential hazards..

11.6 Air Quality Pathways

The air quality pathways are not complete. The Buffalo Hump Mining District is not easily accessible. As previously mentioned, the Mother Lode Mill site has restricted access. All waste sites and previously disturbed sites are stable and the potential to deliver significant dust to casual recreationists, hunters, or cabin owners is very minimal.

Should the Big Buffalo Mine reopen, mine workers are likely to receive appreciable exposures via air pathways. These air pathways would be complete. Although this is an inherent risk of the job, a mine site safety and health plan required by the MSHA should account for management of these risks.

11.7 Soil Exposures

The soil exposure pathways are not complete. No permanent residents presently reside in the Buffalo Hump Mining District. Human use in the area is restricted to seasonal cabin owners, recreationists, and hunters with casual use at best. Therefore, soil pathways are incomplete for these users. During our inspection, none of the cabins in the mining district were occupied. The largest waste dump located at the Mother Lode site has restricted access and no cabin or camping area adjacent to the waste dump.

Should the Big Buffalo Mine reopen, mine workers are likely to receive appreciable exposures via soil pathways. These soil pathways would be complete. Although this is an inherent risk of the job, a mine site safety and health plan required by the MSHA should account for management of these risks.

Section 12. References

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Appendix A. Laboratory Sample Reports



CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX (208) 783-0891

Page 1 of 2

WOH0231

FOR SVL USE ONLY
SVL JOB #

TEMP on Receipt:

Table 1. -- Matrix Type

- 1 = Surface Water, 2 = Ground Water
- 3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
- 6 = Waste, 7 = Other

Report to Company: <u>ITC</u> Contact: <u>Timothy Clapper</u> Address: <u>1410 W. Hillman</u> <u>Boise, ID 83725</u> Phone Number: <u>208 373-0500</u> FAX Number: <u>208 373-0504</u> E-mail: <u>timothy.clapper@itc.com</u>	Invoice Sent To: <u>Timothy Clapper</u> Contact: <u>Same</u> Address: _____ Phone Number: _____ FAX Number: _____ PO#: _____
---	---

Project Name: Bullvale Pump / Dixie / SW
 Sampler's Signature: [Signature]

Indicate State of sample origination: ID

USACE? Yes No

Sample ID	Collection Date Time	Matrix Type (From Table 1)	Misc. No. of Containers	Preservative(s)					Other (Specify)	Analyses Required	Rush Instructions (Days)	Comments
				Unpreserved	HNO ₃ Filtered	HNO ₃ Unfiltered	HCl	H ₂ SO ₄				
1 1C SW 1	7/20/10 13:00 TE		1						X			Total metals Low Hg samples except for Smear (ID) Filtered.
2 1C SW 2	7/20/10 13:00 TE		1						X			
3 1C SW 3	7/20/10 13:00 TE		1						X			
4 1C SW 4	7/20/10 13:00 TE		1						X			
5 1C SW 5	7/20/10 13:00 TE		1						X			
6 1C SW 6	7/20/10 13:00 TE		1						X			
7 1C SW 7	7/20/10 13:00 TE		1						X			
8 1C SW 8 (D)	7/20/10 13:00 TE		1						X			
9 1C SW 9 (T)	7/20/10 13:00 TE		1						X			
10 1C SW 10	7/20/10 13:00 TE		1						X			

Date: 8/9/10 Time: 10:45
 Date: _____ Time: _____

Received by: [Signature]
 Received by: _____



CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

Page 2 of 2

W040231

FOR SVL USE ONLY
SVL JOB #

TEMP on Receipt.

Table 1. -- Matrix Type

1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other

Report to Company: FREG
Contact: Tina Ellyer
Address: 1410 W. HILTON
 Boise ID 83709
Phone Number: 208 373-0563
FAX Number: 208 373-0154
E-mail: Tina.ellyer@freg.com

Invoice Sent To: Tina Ellyer
Contact: DUME
Address:
Phone Number:
FAX Number:
PO#:

Project Name: Buffalo Pump/Ditch
Sampler's Signature: Tina Ellyer (for all)

Indicate State of sample origination: ID Yes No

Sample ID	Collection		Misc.	Preservative(s)						Other (Specify)	Analyses Required	Rush Instructions (Days)	Comments
	Date	Time		Matrix Type (From Table 1)	No. of Containers	Unpreserved	HNO ₃ Filtered	HNO ₃ Unfiltered	HCl				
1	7/27/10	15:40	3	1	X								Total metals - soil samples passed to a mesh
2	7/28/10	14:20	3	1	X								
3	7/27/10	14:05	3	1	X								
4	7/28/10	11:45	3	1	X								
5	7/28/10	16:05	3	1	X								
6	7/28/10	14:35	3	1	X								
7	7/27/10	13:45	3	1	X								
8													
9													
10													

Requisitioned by: Tina Ellyer
Requisitioned by:
Date: 8/9/10
Date:
Time: 10:45
Time:

* Sample Reject: Return Dispose Store (30 days) **White: LAB COPY Yellow: CUSTOMER COPY**



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
LCSW1	W0H0231-01	Surface Water	29-Jul-10 10:30	BS	09-Aug-2010
JCPPEW1	W0H0231-02	Surface Water	28-Jul-10 11:19	TE	09-Aug-2010
SLADSW1	W0H0231-03	Surface Water	28-Jul-10 12:00	TE	09-Aug-2010
BHBGSW1	W0H0231-04	Surface Water	27-Jul-10 13:35	TE	09-Aug-2010
SPSW1	W0H0231-05	Surface Water	30-Jul-10 14:30	BS	09-Aug-2010
SPSW2	W0H0231-06	Surface Water	27-Jul-10 14:00	RH	09-Aug-2010
SMGW1	W0H0231-07	Surface Water	20-Jul-10 13:05	RH	09-Aug-2010
BHBGSD1	W0H0231-08	Soil	27-Jul-10 13:30	DS	09-Aug-2010
MLWD1SS1	W0H0231-09	Soil	28-Jul-10 09:20	TE	09-Aug-2010
SPSD2	W0H0231-10	Soil	27-Jul-10 14:05	RH	09-Aug-2010
JCSD1	W0H0231-11	Soil	28-Jul-10 11:19	DS	09-Aug-2010
LCSD1	W0H0231-12	Soil	29-Jul-10 10:35	BS	09-Aug-2010
SPSD1	W0H0231-13	Soil	30-Jul-10 14:35	BS	09-Aug-2010
BHBGSS1	W0H0231-14	Soil	27-Jul-10 13:40	TE	09-Aug-2010

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 10.0°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W0H0231-01 A	Nitric HDPE	LCSW1	W0H0231-02 A	Nitric HDPE	JCPPEW1
W0H0231-03 A	Nitric HDPE	SLADSW1	W0H0231-04 A	Nitric HDPE	BHBGSW1
W0H0231-05 A	Nitric HDPE	SPSW1	W0H0231-06 A	Nitric HDPE	SPSW2
W0H0231-07 A	Nitric HDPE	SMGW1	W0H0231-07 B	Filtered nitric HDPE	SMGW1
W0H0231-08 A	Bag, cloth	BHBGSD1	W0H0231-09 A	Bag, cloth	MLWD1SS1
W0H0231-10 A	Bag, cloth	SPSD2	W0H0231-11 A	Bag, cloth	JCSD1
W0H0231-12 A	Bag, cloth	LCSD1	W0H0231-13 A	Bag, cloth	SPSD1
W0H0231-14 A	Bag, cloth	BHBGSS1			



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **LCSW1**

SVL Sample ID: **W0H0231-01 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 29-Jul-10 10:30
Received: 09-Aug-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000065		W034083	JAA	08/17/10 14:16	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W033252	DT	09/01/10 12:06	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W033252	DT	09/01/10 12:06	
EPA 6010B	Barium	0.0032	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:06	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:06	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W033252	DT	09/01/10 12:06	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W033252	DT	09/01/10 12:06	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W033252	DT	09/01/10 12:05	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W033252	DT	09/01/10 12:06	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0019		W033252	DT	09/01/10 12:05	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W033252	DT	09/01/10 12:06	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W033252	DT	09/01/10 12:06	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W033252	DT	09/01/10 12:06	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **JCPPESW1**

SVL Sample ID: **W0H0231-02 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 28-Jul-10 11:19
Received: 09-Aug-10
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000065		W033228	JAA	08/13/10 08:36	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W033252	DT	09/01/10 12:11	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W033252	DT	09/01/10 12:11	
EPA 6010B	Barium	0.0055	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:11	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:11	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W033252	DT	09/01/10 12:11	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W033252	DT	09/01/10 12:11	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W033252	DT	09/01/10 12:10	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W033252	DT	09/01/10 12:11	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0019		W033252	DT	09/01/10 12:10	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W033252	DT	09/01/10 12:11	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W033252	DT	09/01/10 12:11	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W033252	DT	09/01/10 12:11	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **SLADSW1**

SVL Sample ID: **W0H0231-03 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 28-Jul-10 12:00
Received: 09-Aug-10
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000065		W033228	JAA	08/13/10 08:41	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W033252	DT	09/01/10 12:17	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W033252	DT	09/01/10 12:17	
EPA 6010B	Barium	0.0126	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:17	
EPA 6010B	Cadmium	0.0033	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:17	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W033252	DT	09/01/10 12:17	
EPA 6010B	Copper	0.047	mg/L	0.010	0.005		W033252	DT	09/01/10 12:16	
EPA 6010B	Iron	1.54	mg/L	0.060	0.027		W033252	DT	09/01/10 12:15	
EPA 6010B	Lead	0.268	mg/L	0.0075	0.0040		W033252	DT	09/01/10 12:17	
EPA 6010B	Manganese	0.0343	mg/L	0.0040	0.0019		W033252	DT	09/01/10 12:15	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W033252	DT	09/01/10 12:17	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W033252	DT	09/01/10 12:16	
EPA 6010B	Zinc	0.0896	mg/L	0.0100	0.0019		W033252	DT	09/01/10 12:17	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **BHBGSW1**

SVL Sample ID: **W0H0231-04 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 27-Jul-10 13:35
Received: 09-Aug-10
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000065		W033228	JAA	08/13/10 08:43	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W033252	DT	09/01/10 12:33	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W033252	DT	09/01/10 12:33	
EPA 6010B	Barium	0.0157	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:33	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:33	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W033252	DT	09/01/10 12:33	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W033252	DT	09/01/10 12:32	
EPA 6010B	Iron	0.762	mg/L	0.060	0.027		W033252	DT	09/01/10 12:31	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W033252	DT	09/01/10 12:33	
EPA 6010B	Manganese	0.0494	mg/L	0.0040	0.0019		W033252	DT	09/01/10 12:31	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W033252	DT	09/01/10 12:33	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W033252	DT	09/01/10 12:32	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W033252	DT	09/01/10 12:33	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **SPSW1**

SVL Sample ID: **W0H0231-05 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 30-Jul-10 14:30
Received: 09-Aug-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000065		W033228	JAA	08/13/10 08:45	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W033252	DT	09/01/10 12:38	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W033252	DT	09/01/10 12:38	
EPA 6010B	Barium	0.0228	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:38	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:38	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W033252	DT	09/01/10 12:38	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W033252	DT	09/01/10 12:38	
EPA 6010B	Iron	1.05	mg/L	0.060	0.027		W033252	DT	09/01/10 12:37	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W033252	DT	09/01/10 12:38	
EPA 6010B	Manganese	0.0663	mg/L	0.0040	0.0019		W033252	DT	09/01/10 12:37	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W033252	DT	09/01/10 12:38	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W033252	DT	09/01/10 12:38	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W033252	DT	09/01/10 12:38	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **SPSW2**

SVL Sample ID: **W0H0231-06 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 27-Jul-10 14:00
Received: 09-Aug-10
Sampled By: RH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000065		W033228	JAA	08/13/10 08:46	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W033252	DT	09/01/10 12:43	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W033252	DT	09/01/10 12:43	
EPA 6010B	Barium	0.0049	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:43	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:43	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W033252	DT	09/01/10 12:43	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W033252	DT	09/01/10 12:43	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W033252	DT	09/01/10 12:42	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W033252	DT	09/01/10 12:43	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0019		W033252	DT	09/01/10 12:42	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W033252	DT	09/01/10 12:43	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W033252	DT	09/01/10 12:43	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W033252	DT	09/01/10 12:43	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **SMGW1**

SVL Sample ID: **W0H0231-07 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 20-Jul-10 13:05
Received: 09-Aug-10
Sampled By: RH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000065		W033228	JAA	08/13/10 08:48	
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Metals (Total Recoverable)

EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W033252	DT	09/01/10 12:59	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W033252	DT	09/01/10 12:59	
EPA 6010B	Barium	0.0836	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:59	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W033252	DT	09/01/10 12:59	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W033252	DT	09/01/10 12:59	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W033252	DT	09/01/10 12:59	
EPA 6010B	Iron	0.107	mg/L	0.060	0.027		W033252	DT	09/01/10 12:58	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W033252	DT	09/01/10 12:59	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0019		W033252	DT	09/01/10 12:58	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W033252	DT	09/01/10 12:59	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W033252	DT	09/01/10 12:59	
EPA 6010B	Zinc	0.619	mg/L	0.0100	0.0019		W033252	DT	09/01/10 12:59	

Metals (Dissolved)

EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.005		W033255	DT	08/19/10 13:35	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.005		W033255	DT	08/19/10 13:35	
EPA 6010B	Barium	0.0796	mg/L	0.0020	0.0007		W033255	DT	08/19/10 13:35	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W033255	DT	08/19/10 13:35	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W033255	DT	08/19/10 13:35	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W033255	DT	08/19/10 13:35	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.018		W033255	DT	08/19/10 13:34	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W033255	DT	08/19/10 13:35	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0019		W033255	DT	08/19/10 13:34	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W033255	DT	08/19/10 13:35	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0012		W033255	DT	08/19/10 13:35	
EPA 6010B	Zinc	0.582	mg/L	0.0100	0.0016		W033255	DT	08/19/10 13:35	
EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000065		W033227	JAA	08/13/10 08:25	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **BHBGSD1**

SVL Sample ID: **W0H0231-08 (Soil)**

Sample Report Page 1 of 1

Sampled: 27-Jul-10 13:30
Received: 09-Aug-10
Sampled By: DS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.3		W034164	DT	08/30/10 17:08	
EPA 6010B	Arsenic	< 2.5	mg/kg	2.5	0.5		W034164	DT	08/30/10 17:08	
EPA 6010B	Barium	12.8	mg/kg	0.20	0.02		W034164	DT	08/30/10 17:07	
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.03		W034164	DT	08/30/10 17:07	
EPA 6010B	Chromium	13.9	mg/kg	0.60	0.07		W034164	DT	08/30/10 17:07	
EPA 6010B	Copper	8.41	mg/kg	1.00	0.21		W034164	DT	08/30/10 17:07	
EPA 6010B	Iron	8620	mg/kg	6.0	1.0		W034164	DT	08/30/10 17:06	
EPA 6010B	Lead	2.07	mg/kg	0.75	0.36		W034164	DT	08/30/10 17:08	
EPA 6010B	Manganese	276	mg/kg	0.40	0.06		W034164	DT	08/30/10 17:06	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.4		W034164	DT	08/30/10 17:08	
EPA 6010B	Silver	< 0.50	mg/kg	0.50	0.04		W034164	DT	08/30/10 17:07	
EPA 6010B	Zinc	16.2	mg/kg	1.00	0.22		W034164	DT	08/30/10 17:08	
EPA 7471A	Mercury	0.035	mg/kg	0.033	0.010		W033173	JAA	08/17/10 11:09	
Percent Solids										
Percent Solids	% Solids	96.8	%	0.1			W034163	DP	08/19/10 11:13	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **MLWD1SS1**

SVL Sample ID: **W0H0231-09 (Soil)**

Sample Report Page 1 of 1

Sampled: 28-Jul-10 09:20
Received: 09-Aug-10
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	19.1	mg/kg	2.0	0.3		W034164	DT	08/30/10 17:13	
EPA 6010B	Arsenic	12.8	mg/kg	2.5	0.5		W034164	DT	08/30/10 17:13	
EPA 6010B	Barium	58.6	mg/kg	0.20	0.02		W034164	DT	08/30/10 17:13	
EPA 6010B	Cadmium	1.04	mg/kg	0.20	0.03		W034164	DT	08/30/10 17:13	
EPA 6010B	Chromium	< 0.60	mg/kg	0.60	0.07		W034164	DT	08/30/10 17:13	
EPA 6010B	Copper	54.0	mg/kg	1.00	0.21		W034164	DT	08/30/10 17:13	
EPA 6010B	Iron	4320	mg/kg	6.0	1.0		W034164	DT	08/30/10 17:11	
EPA 6010B	Lead	311	mg/kg	0.75	0.36		W034164	DT	08/30/10 17:13	
EPA 6010B	Manganese	33.2	mg/kg	0.40	0.06		W034164	DT	08/30/10 17:12	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.4		W034164	DT	08/30/10 17:13	
EPA 6010B	Silver	9.56	mg/kg	0.50	0.04		W034164	DT	08/30/10 17:13	
EPA 6010B	Zinc	55.4	mg/kg	1.00	0.22		W034164	DT	08/30/10 17:13	
EPA 7471A	Mercury	3.18	mg/kg	0.330	0.095	10	W033173	JAA	08/17/10 13:19	D2
Percent Solids										
Percent Solids	% Solids	95.0	%	0.1			W034163	DP	08/19/10 11:13	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **SPSD2**

SVL Sample ID: **W0H0231-10 (Soil)**

Sample Report Page 1 of 1

Sampled: 27-Jul-10 14:05
Received: 09-Aug-10
Sampled By: RH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	3.0	mg/kg	2.0	0.3		W034164	DT	08/30/10 17:19	
EPA 6010B	Arsenic	2.7	mg/kg	2.5	0.5		W034164	DT	08/30/10 17:19	
EPA 6010B	Barium	26.2	mg/kg	0.20	0.02		W034164	DT	08/30/10 17:18	
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.03		W034164	DT	08/30/10 17:18	
EPA 6010B	Chromium	9.10	mg/kg	0.60	0.07		W034164	DT	08/30/10 17:18	
EPA 6010B	Copper	10.3	mg/kg	1.00	0.21		W034164	DT	08/30/10 17:18	
EPA 6010B	Iron	6030	mg/kg	6.0	1.0		W034164	DT	08/30/10 17:17	
EPA 6010B	Lead	33.6	mg/kg	0.75	0.36		W034164	DT	08/30/10 17:19	
EPA 6010B	Manganese	103	mg/kg	0.40	0.06		W034164	DT	08/30/10 17:17	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.4		W034164	DT	08/30/10 17:19	
EPA 6010B	Silver	2.40	mg/kg	0.50	0.04		W034164	DT	08/30/10 17:18	
EPA 6010B	Zinc	35.6	mg/kg	1.00	0.22		W034164	DT	08/30/10 17:18	
EPA 7471A	Mercury	0.528	mg/kg	0.033	0.010		W033173	JAA	08/17/10 11:14	
Percent Solids										
Percent Solids	% Solids	95.3	%	0.1			W034163	DP	08/19/10 11:13	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **JCSD1**

SVL Sample ID: **W0H0231-11 (Soil)**

Sample Report Page 1 of 1

Sampled: 28-Jul-10 11:19
Received: 09-Aug-10
Sampled By: DS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.3		W034164	DT	08/30/10 17:24	
EPA 6010B	Arsenic	< 2.5	mg/kg	2.5	0.5		W034164	DT	08/30/10 17:24	
EPA 6010B	Barium	16.4	mg/kg	0.20	0.02		W034164	DT	08/30/10 17:24	
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.03		W034164	DT	08/30/10 17:24	
EPA 6010B	Chromium	6.38	mg/kg	0.60	0.07		W034164	DT	08/30/10 17:24	
EPA 6010B	Copper	3.53	mg/kg	1.00	0.21		W034164	DT	08/30/10 17:24	
EPA 6010B	Iron	5190	mg/kg	6.0	1.0		W034164	DT	08/30/10 17:22	
EPA 6010B	Lead	6.69	mg/kg	0.75	0.36		W034164	DT	08/30/10 17:24	
EPA 6010B	Manganese	74.1	mg/kg	0.40	0.06		W034164	DT	08/30/10 17:23	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.4		W034164	DT	08/30/10 17:24	
EPA 6010B	Silver	< 0.50	mg/kg	0.50	0.04		W034164	DT	08/30/10 17:24	
EPA 6010B	Zinc	10.3	mg/kg	1.00	0.22		W034164	DT	08/30/10 17:24	
EPA 7471A	Mercury	0.052	mg/kg	0.033	0.010		W033173	JAA	08/17/10 11:19	
Percent Solids										
Percent Solids	% Solids	96.0	%	0.1			W034163	DP	08/19/10 11:13	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **LCSD1**
SVL Sample ID: **W0H0231-12 (Soil)**

Sampled: 29-Jul-10 10:35
Received: 09-Aug-10
Sampled By: BS

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.3		W034164	DT	08/30/10 17:29	
EPA 6010B	Arsenic	2.7	mg/kg	2.5	0.5		W034164	DT	08/30/10 17:29	
EPA 6010B	Barium	20.0	mg/kg	0.20	0.02		W034164	DT	08/30/10 17:29	
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.03		W034164	DT	08/30/10 17:29	
EPA 6010B	Chromium	3.73	mg/kg	0.60	0.07		W034164	DT	08/30/10 17:29	
EPA 6010B	Copper	6.07	mg/kg	1.00	0.21		W034164	DT	08/30/10 17:29	
EPA 6010B	Iron	4040	mg/kg	6.0	1.0		W034164	DT	08/30/10 17:28	
EPA 6010B	Lead	12.6	mg/kg	0.75	0.36		W034164	DT	08/30/10 17:29	
EPA 6010B	Manganese	204	mg/kg	0.40	0.06		W034164	DT	08/30/10 17:28	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.4		W034164	DT	08/30/10 17:29	
EPA 6010B	Silver	2.78	mg/kg	0.50	0.04		W034164	DT	08/30/10 17:29	
EPA 6010B	Zinc	16.5	mg/kg	1.00	0.22		W034164	DT	08/30/10 17:29	
EPA 7471A	Mercury	0.088	mg/kg	0.033	0.010		W033173	JAA	08/17/10 11:21	
Percent Solids										
Percent Solids	% Solids	92.9	%	0.1			W034163	DP	08/19/10 11:13	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **SPSD1**
SVL Sample ID: **W0H0231-13 (Soil)**

Sampled: 30-Jul-10 14:35
Received: 09-Aug-10
Sampled By: BS

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.3		W034164	DT	08/30/10 17:35	
EPA 6010B	Arsenic	21.0	mg/kg	2.5	0.5		W034164	DT	08/30/10 17:35	
EPA 6010B	Barium	64.1	mg/kg	0.20	0.02		W034164	DT	08/30/10 17:34	
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.03		W034164	DT	08/30/10 17:35	
EPA 6010B	Chromium	3.37	mg/kg	0.60	0.07		W034164	DT	08/30/10 17:35	
EPA 6010B	Copper	4.20	mg/kg	1.00	0.21		W034164	DT	08/30/10 17:34	
EPA 6010B	Iron	9600	mg/kg	6.0	1.0		W034164	DT	08/30/10 17:33	
EPA 6010B	Lead	3.61	mg/kg	0.75	0.36		W034164	DT	08/30/10 17:35	
EPA 6010B	Manganese	65.8	mg/kg	0.40	0.06		W034164	DT	08/30/10 17:33	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.4		W034164	DT	08/30/10 17:35	
EPA 6010B	Silver	0.56	mg/kg	0.50	0.04		W034164	DT	08/30/10 17:34	
EPA 6010B	Zinc	14.5	mg/kg	1.00	0.22		W034164	DT	08/30/10 17:35	
EPA 7471A	Mercury	< 0.033	mg/kg	0.033	0.010		W033173	JAA	08/17/10 11:22	
Percent Solids										
Percent Solids	% Solids	95.3	%	0.1			W034163	DP	08/19/10 11:13	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Client Sample ID: **BHBGSS1**

SVL Sample ID: **W0H0231-14 (Soil)**

Sample Report Page 1 of 1

Sampled: 27-Jul-10 13:40
Received: 09-Aug-10
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.3		W034164	DT	08/30/10 17:40	
EPA 6010B	Arsenic	< 2.5	mg/kg	2.5	0.5		W034164	DT	08/30/10 17:40	
EPA 6010B	Barium	31.3	mg/kg	0.20	0.02		W034164	DT	08/30/10 17:40	
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.03		W034164	DT	08/30/10 17:40	
EPA 6010B	Chromium	12.5	mg/kg	0.60	0.07		W034164	DT	08/30/10 17:40	
EPA 6010B	Copper	9.08	mg/kg	1.00	0.21		W034164	DT	08/30/10 17:40	
EPA 6010B	Iron	9230	mg/kg	6.0	1.0		W034164	DT	08/30/10 17:38	
EPA 6010B	Lead	6.54	mg/kg	0.75	0.36		W034164	DT	08/30/10 17:40	
EPA 6010B	Manganese	258	mg/kg	0.40	0.06		W034164	DT	08/30/10 17:38	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.4		W034164	DT	08/30/10 17:40	
EPA 6010B	Silver	0.55	mg/kg	0.50	0.04		W034164	DT	08/30/10 17:40	
EPA 6010B	Zinc	23.2	mg/kg	1.00	0.22		W034164	DT	08/30/10 17:40	
EPA 7471A	Mercury	< 0.033	mg/kg	0.033	0.010		W033173	JAA	08/17/10 11:24	
Percent Solids										
Percent Solids	% Solids	90.8	%	0.1			W034163	DP	08/19/10 11:13	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	mg/L	<0.00020	0.000065	0.00020	W033228	13-Aug-10	
EPA 7470A	Mercury	mg/L	<0.00020	0.000065	0.00020	W034083	17-Aug-10	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	<2.0	0.3	2.0	W034164	30-Aug-10	
EPA 6010B	Arsenic	mg/kg	<2.5	0.5	2.5	W034164	30-Aug-10	
EPA 6010B	Barium	mg/kg	<0.20	0.02	0.20	W034164	30-Aug-10	
EPA 6010B	Cadmium	mg/kg	<0.20	0.03	0.20	W034164	30-Aug-10	
EPA 6010B	Chromium	mg/kg	<0.60	0.07	0.60	W034164	30-Aug-10	
EPA 6010B	Copper	mg/kg	<1.00	0.21	1.00	W034164	30-Aug-10	
EPA 6010B	Iron	mg/kg	<6.0	1.0	6.0	W034164	30-Aug-10	
EPA 6010B	Lead	mg/kg	<0.75	0.36	0.75	W034164	30-Aug-10	
EPA 6010B	Manganese	mg/kg	<0.40	0.06	0.40	W034164	30-Aug-10	
EPA 6010B	Selenium	mg/kg	<4.0	1.4	4.0	W034164	30-Aug-10	
EPA 6010B	Silver	mg/kg	<0.50	0.04	0.50	W034164	30-Aug-10	
EPA 6010B	Zinc	mg/kg	<1.00	0.22	1.00	W034164	30-Aug-10	
EPA 7471A	Mercury	mg/kg	<0.033	0.010	0.033	W033173	17-Aug-10	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	<0.020	0.004	0.020	W033252	01-Sep-10	
EPA 6010B	Arsenic	mg/L	<0.025	0.006	0.025	W033252	01-Sep-10	
EPA 6010B	Barium	mg/L	<0.0020	0.0005	0.0020	W033252	01-Sep-10	
EPA 6010B	Cadmium	mg/L	<0.0020	0.0005	0.0020	W033252	01-Sep-10	
EPA 6010B	Chromium	mg/L	<0.0060	0.0009	0.0060	W033252	01-Sep-10	
EPA 6010B	Copper	mg/L	<0.010	0.005	0.010	W033252	01-Sep-10	
EPA 6010B	Iron	mg/L	<0.060	0.027	0.060	W033252	01-Sep-10	
EPA 6010B	Lead	mg/L	<0.0075	0.0040	0.0075	W033252	01-Sep-10	
EPA 6010B	Manganese	mg/L	<0.0040	0.0019	0.0040	W033252	01-Sep-10	
EPA 6010B	Selenium	mg/L	<0.040	0.013	0.040	W033252	01-Sep-10	
EPA 6010B	Silver	mg/L	<0.0050	0.0014	0.0050	W033252	01-Sep-10	
EPA 6010B	Zinc	mg/L	<0.0100	0.0019	0.0100	W033252	01-Sep-10	

Metals (Dissolved)

EPA 6010B	Antimony	mg/L	<0.020	0.005	0.020	W033255	19-Aug-10	
EPA 6010B	Arsenic	mg/L	<0.025	0.005	0.025	W033255	19-Aug-10	
EPA 6010B	Barium	mg/L	<0.0020	0.0007	0.0020	W033255	19-Aug-10	
EPA 6010B	Cadmium	mg/L	<0.0020	0.0005	0.0020	W033255	19-Aug-10	
EPA 6010B	Chromium	mg/L	<0.0060	0.0009	0.0060	W033255	19-Aug-10	
EPA 6010B	Copper	mg/L	<0.010	0.005	0.010	W033255	19-Aug-10	
EPA 6010B	Iron	mg/L	<0.060	0.018	0.060	W033255	19-Aug-10	
EPA 6010B	Lead	mg/L	<0.0075	0.0040	0.0075	W033255	19-Aug-10	
EPA 6010B	Manganese	mg/L	<0.0040	0.0019	0.0040	W033255	19-Aug-10	
EPA 6010B	Selenium	mg/L	<0.040	0.013	0.040	W033255	19-Aug-10	
EPA 6010B	Silver	mg/L	<0.0050	0.0012	0.0050	W033255	19-Aug-10	
EPA 6010B	Zinc	mg/L	<0.0100	0.0016	0.0100	W033255	19-Aug-10	
EPA 7470A	Mercury	mg/L	<0.00020	0.000065	0.00020	W033227	13-Aug-10	



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	mg/L	0.00450	0.00500	90.0	80 - 120	W033228	13-Aug-10	
EPA 7470A	Mercury	mg/L	0.00520	0.00500	104	80 - 120	W034083	17-Aug-10	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	93.0	100	93.0	80 - 120	W034164	30-Aug-10	
EPA 6010B	Arsenic	mg/kg	90.8	100	90.8	80 - 120	W034164	30-Aug-10	
EPA 6010B	Barium	mg/kg	96.5	100	96.5	80 - 120	W034164	30-Aug-10	
EPA 6010B	Cadmium	mg/kg	94.3	100	94.3	80 - 120	W034164	30-Aug-10	
EPA 6010B	Chromium	mg/kg	96.7	100	96.7	80 - 120	W034164	30-Aug-10	
EPA 6010B	Copper	mg/kg	95.3	100	95.3	80 - 120	W034164	30-Aug-10	
EPA 6010B	Iron	mg/kg	944	1000	94.4	80 - 120	W034164	30-Aug-10	
EPA 6010B	Lead	mg/kg	94.2	100	94.2	80 - 120	W034164	30-Aug-10	
EPA 6010B	Manganese	mg/kg	97.9	100	97.9	80 - 120	W034164	30-Aug-10	
EPA 6010B	Selenium	mg/kg	90.1	100	90.1	80 - 120	W034164	30-Aug-10	
EPA 6010B	Silver	mg/kg	4.85	5.00	97.0	80 - 120	W034164	30-Aug-10	
EPA 6010B	Zinc	mg/kg	91.9	100	91.9	80 - 120	W034164	30-Aug-10	
EPA 7471A	Mercury	mg/kg	0.845	0.833	101	80 - 120	W033173	17-Aug-10	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	1.04	1.00	104	80 - 120	W033252	01-Sep-10	
EPA 6010B	Arsenic	mg/L	1.03	1.00	103	80 - 120	W033252	01-Sep-10	
EPA 6010B	Barium	mg/L	1.09	1.00	109	80 - 120	W033252	01-Sep-10	
EPA 6010B	Cadmium	mg/L	1.06	1.00	106	80 - 120	W033252	01-Sep-10	
EPA 6010B	Chromium	mg/L	1.07	1.00	107	80 - 120	W033252	01-Sep-10	
EPA 6010B	Copper	mg/L	1.06	1.00	106	80 - 120	W033252	01-Sep-10	
EPA 6010B	Iron	mg/L	10.2	10.0	102	80 - 120	W033252	01-Sep-10	
EPA 6010B	Lead	mg/L	1.04	1.00	104	80 - 120	W033252	01-Sep-10	
EPA 6010B	Manganese	mg/L	1.04	1.00	104	80 - 120	W033252	01-Sep-10	
EPA 6010B	Selenium	mg/L	1.04	1.00	104	80 - 120	W033252	01-Sep-10	
EPA 6010B	Silver	mg/L	0.0547	0.0500	109	80 - 120	W033252	01-Sep-10	
EPA 6010B	Zinc	mg/L	1.05	1.00	105	80 - 120	W033252	01-Sep-10	

Metals (Dissolved)

EPA 6010B	Antimony	mg/L	0.908	1.00	90.8	80 - 120	W033255	19-Aug-10	
EPA 6010B	Arsenic	mg/L	0.897	1.00	89.7	80 - 120	W033255	19-Aug-10	
EPA 6010B	Barium	mg/L	0.936	1.00	93.6	80 - 120	W033255	19-Aug-10	
EPA 6010B	Cadmium	mg/L	0.905	1.00	90.5	80 - 120	W033255	19-Aug-10	
EPA 6010B	Chromium	mg/L	0.927	1.00	92.7	80 - 120	W033255	19-Aug-10	
EPA 6010B	Copper	mg/L	0.945	1.00	94.5	80 - 120	W033255	19-Aug-10	
EPA 6010B	Iron	mg/L	9.27	10.0	92.7	80 - 120	W033255	19-Aug-10	
EPA 6010B	Lead	mg/L	0.920	1.00	92.0	80 - 120	W033255	19-Aug-10	
EPA 6010B	Manganese	mg/L	0.924	1.00	92.4	80 - 120	W033255	19-Aug-10	
EPA 6010B	Selenium	mg/L	0.891	1.00	89.1	80 - 120	W033255	19-Aug-10	
EPA 6010B	Silver	mg/L	0.0469	0.0500	93.7	80 - 120	W033255	19-Aug-10	
EPA 6010B	Zinc	mg/L	0.895	1.00	89.5	80 - 120	W033255	19-Aug-10	
EPA 7470A	Mercury	mg/L	0.00431	0.00500	86.2	80 - 120	W033227	13-Aug-10	



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	mg/L	0.00086	<0.00020	0.00100	86.0	75 - 125	W033228	13-Aug-10	
EPA 7470A	Mercury	mg/L	0.00107	<0.00020	0.00100	107	75 - 125	W034083	17-Aug-10	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	67.1	5.8	100	61.3	75 - 125	W034164	30-Aug-10	M2
EPA 6010B	Arsenic	mg/kg	623	469	100	R > 4S	75 - 125	W034164	30-Aug-10	M3
EPA 6010B	Barium	mg/kg	1870	1520	100	R > 4S	75 - 125	W034164	30-Aug-10	M3
EPA 6010B	Cadmium	mg/kg	95.0	0.91	100	94.1	75 - 125	W034164	30-Aug-10	
EPA 6010B	Chromium	mg/kg	111	6.60	100	104	75 - 125	W034164	30-Aug-10	
EPA 6010B	Copper	mg/kg	109	11.0	100	98.0	75 - 125	W034164	30-Aug-10	
EPA 6010B	Iron	mg/kg	7840	6360	1000	R > 4S	75 - 125	W034164	30-Aug-10	M3
EPA 6010B	Lead	mg/kg	130	32.2	100	98.0	75 - 125	W034164	30-Aug-10	
EPA 6010B	Manganese	mg/kg	301	190	100	111	75 - 125	W034164	30-Aug-10	
EPA 6010B	Selenium	mg/kg	94.6	<4.0	100	94.6	75 - 125	W034164	30-Aug-10	
EPA 6010B	Silver	mg/kg	5.61	<0.50	5.00	102	75 - 125	W034164	30-Aug-10	
EPA 6010B	Zinc	mg/kg	241	151	100	90.0	75 - 125	W034164	30-Aug-10	
EPA 7471A	Mercury	mg/kg	0.190	0.035	0.167	93.0	75 - 125	W033173	17-Aug-10	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	0.946	<0.020	1.00	94.6	75 - 125	W033252	01-Sep-10	
EPA 6010B	Arsenic	mg/L	0.928	<0.025	1.00	92.8	75 - 125	W033252	01-Sep-10	
EPA 6010B	Barium	mg/L	1.01	0.0126	1.00	99.8	75 - 125	W033252	01-Sep-10	
EPA 6010B	Cadmium	mg/L	0.966	0.0033	1.00	96.3	75 - 125	W033252	01-Sep-10	
EPA 6010B	Chromium	mg/L	0.985	<0.0060	1.00	98.5	75 - 125	W033252	01-Sep-10	
EPA 6010B	Copper	mg/L	1.04	0.047	1.00	99.2	75 - 125	W033252	01-Sep-10	
EPA 6010B	Iron	mg/L	12.2	1.54	10.0	106	75 - 125	W033252	01-Sep-10	
EPA 6010B	Lead	mg/L	1.21	0.268	1.00	93.8	75 - 125	W033252	01-Sep-10	
EPA 6010B	Manganese	mg/L	1.13	0.0343	1.00	110	75 - 125	W033252	01-Sep-10	
EPA 6010B	Selenium	mg/L	0.925	<0.040	1.00	92.5	75 - 125	W033252	01-Sep-10	
EPA 6010B	Silver	mg/L	0.0513	<0.0050	0.0500	103	75 - 125	W033252	01-Sep-10	
EPA 6010B	Zinc	mg/L	1.04	0.0896	1.00	94.8	75 - 125	W033252	01-Sep-10	

Metals (Dissolved)

EPA 6010B	Antimony	mg/L	1.03	<0.020	1.00	101	75 - 125	W033255	19-Aug-10	
EPA 6010B	Arsenic	mg/L	1.03	<0.025	1.00	102	75 - 125	W033255	19-Aug-10	
EPA 6010B	Barium	mg/L	1.04	0.0450	1.00	100	75 - 125	W033255	19-Aug-10	
EPA 6010B	Cadmium	mg/L	0.963	<0.0020	1.00	96.3	75 - 125	W033255	19-Aug-10	
EPA 6010B	Chromium	mg/L	0.983	<0.0060	1.00	98.1	75 - 125	W033255	19-Aug-10	
EPA 6010B	Copper	mg/L	1.04	<0.010	1.00	103	75 - 125	W033255	19-Aug-10	
EPA 6010B	Iron	mg/L	10.1	0.321	10.0	98.2	75 - 125	W033255	19-Aug-10	
EPA 6010B	Lead	mg/L	0.980	<0.0075	1.00	97.5	75 - 125	W033255	19-Aug-10	
EPA 6010B	Manganese	mg/L	1.06	0.0776	1.00	98.3	75 - 125	W033255	19-Aug-10	
EPA 6010B	Selenium	mg/L	1.03	<0.040	1.00	103	75 - 125	W033255	19-Aug-10	
EPA 6010B	Silver	mg/L	0.0518	<0.0050	0.0500	104	75 - 125	W033255	19-Aug-10	
EPA 6010B	Zinc	mg/L	0.957	<0.0100	1.00	95.0	75 - 125	W033255	19-Aug-10	
EPA 7470A	Mercury	mg/L	0.00094	<0.00020	0.00100	94.0	75 - 125	W033227	13-Aug-10	



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	mg/L	0.00085	0.00086	0.00100	1.2	20	W033228	13-Aug-10	
EPA 7470A	Mercury	mg/L	0.00108	0.00107	0.00100	0.9	20	W034083	17-Aug-10	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	66.4	67.1	100	1.0	20	W034164	30-Aug-10	
EPA 6010B	Arsenic	mg/kg	627	623	100	0.6	20	W034164	30-Aug-10	
EPA 6010B	Barium	mg/kg	1900	1870	100	1.6	20	W034164	30-Aug-10	
EPA 6010B	Cadmium	mg/kg	94.9	95.0	100	0.1	20	W034164	30-Aug-10	
EPA 6010B	Chromium	mg/kg	111	111	100	0.2	20	W034164	30-Aug-10	
EPA 6010B	Copper	mg/kg	110	109	100	0.7	20	W034164	30-Aug-10	
EPA 6010B	Iron	mg/kg	7940	7840	1000	1.4	20	W034164	30-Aug-10	
EPA 6010B	Lead	mg/kg	132	130	100	1.2	20	W034164	30-Aug-10	
EPA 6010B	Manganese	mg/kg	305	301	100	1.4	20	W034164	30-Aug-10	
EPA 6010B	Selenium	mg/kg	96.0	94.6	100	1.5	20	W034164	30-Aug-10	
EPA 6010B	Silver	mg/kg	5.59	5.61	5.00	0.4	20	W034164	30-Aug-10	
EPA 6010B	Zinc	mg/kg	244	241	100	1.4	20	W034164	30-Aug-10	
EPA 7471A	Mercury	mg/kg	0.177	0.190	0.167	7.3	20	W033173	17-Aug-10	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	0.964	0.946	1.00	2.0	20	W033252	01-Sep-10	
EPA 6010B	Arsenic	mg/L	0.940	0.928	1.00	1.4	20	W033252	01-Sep-10	
EPA 6010B	Barium	mg/L	1.07	1.01	1.00	6.1	20	W033252	01-Sep-10	
EPA 6010B	Cadmium	mg/L	1.03	0.966	1.00	6.0	20	W033252	01-Sep-10	
EPA 6010B	Chromium	mg/L	1.05	0.985	1.00	6.1	20	W033252	01-Sep-10	
EPA 6010B	Copper	mg/L	1.11	1.04	1.00	6.5	20	W033252	01-Sep-10	
EPA 6010B	Iron	mg/L	11.6	12.2	10.0	5.1	20	W033252	01-Sep-10	
EPA 6010B	Lead	mg/L	1.22	1.21	1.00	1.5	20	W033252	01-Sep-10	
EPA 6010B	Manganese	mg/L	1.08	1.13	1.00	4.8	20	W033252	01-Sep-10	
EPA 6010B	Selenium	mg/L	0.934	0.925	1.00	1.0	20	W033252	01-Sep-10	
EPA 6010B	Silver	mg/L	0.0541	0.0513	0.0500	5.2	20	W033252	01-Sep-10	
EPA 6010B	Zinc	mg/L	1.10	1.04	1.00	6.3	20	W033252	01-Sep-10	

Metals (Dissolved)

EPA 6010B	Antimony	mg/L	1.02	1.03	1.00	0.2	20	W033255	19-Aug-10	
EPA 6010B	Arsenic	mg/L	1.03	1.03	1.00	0.2	20	W033255	19-Aug-10	
EPA 6010B	Barium	mg/L	1.04	1.04	1.00	0.0	20	W033255	19-Aug-10	
EPA 6010B	Cadmium	mg/L	0.964	0.963	1.00	0.1	20	W033255	19-Aug-10	
EPA 6010B	Chromium	mg/L	0.982	0.983	1.00	0.1	20	W033255	19-Aug-10	
EPA 6010B	Copper	mg/L	1.05	1.04	1.00	0.8	20	W033255	19-Aug-10	
EPA 6010B	Iron	mg/L	10.0	10.1	10.0	1.3	20	W033255	19-Aug-10	
EPA 6010B	Lead	mg/L	0.977	0.980	1.00	0.3	20	W033255	19-Aug-10	
EPA 6010B	Manganese	mg/L	1.05	1.06	1.00	1.2	20	W033255	19-Aug-10	
EPA 6010B	Selenium	mg/L	1.02	1.03	1.00	0.8	20	W033255	19-Aug-10	
EPA 6010B	Silver	mg/L	0.0515	0.0518	0.0500	0.6	20	W033255	19-Aug-10	
EPA 6010B	Zinc	mg/L	0.958	0.957	1.00	0.1	20	W033255	19-Aug-10	
EPA 7470A	Mercury	mg/L	0.00099	0.00094	0.00100	5.2	20	W033227	13-Aug-10	



IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0H0231**
Reported: 02-Sep-10 14:54

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	95.2	5.8	100	89.4	75 - 125	W034164	30-Aug-10	
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Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable