VIENNA MINING DISTRICT

AKA: Wisconsin Mill, Webfoot Mine and Mill, Numa Tunnel, Vienna Mine, Vienna Group, Solace Mine, Solace Group, Emma Mine, Coleman Tunnel, Rebellion Tunnel, Nellie Extension Tunnel, Cargill Mill Site, Alabama Mill Site, Hidden Treasure Mill Site, and miscellaneous patented mine and mill site claims

PRELIMINARY ASSESSMENT AND SITE INSPECTION REPORT

Blaine and Camas Counties
State of Idaho

Department of Environmental Quality

November 2010

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

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STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

November 4, 2010

Terrawiggly LLC
c/o Mr. Allen Jones
Smiley Creek Lodge
HC 64 Box 9102
Ketchum, ID 83340

William D. Arvey Trust
c/o Ms. Marti Arvey
101 South Hiawatha Drive
Hailey, ID 83333

Subject: Preliminary Assessment and Site Inspection (PA/SI) Report for the Vienna Mining District

Dear Mr. Jones and Ms. Arvey:

The Idaho Department of Environmental Quality (DEQ) has completed the PA/SI report for your properties and numerous adjoining properties in the Vienna Mining District. We again thank you for the privilege of accessing your properties, and hope our work is useful to you in managing what we believe are limited risks on or associated with your properties. DEQ's discussions, conclusions, and recommendations are based on existing conditions and may change if future uses or site conditions change.

Generally speaking, toxicological risks to human and ecological receptors are limited to exposures to soils and sediment at the mine and mill sites, particularly the Wisconsin Mill Site and the Webfoot Mine. Surface and ground water quality at various locations around the Vienna Mining District appears to meet Idaho's Water Quality Standards. There are numerous indications erosion is a serious concern for the Webfoot Mine. Furthermore, the site assessment was conducted during low flow/runoff conditions when it might be expected loading is at its lowest point, and the assessment was limited by these conditions.

Exposure to heavy metals due to air pathways and dermal contact with soils appears to be likely for site workers but minimal for recreational users or down stream residents. Although risks at or down gradient to the site(s) appear minimal, DEQ is making numerous recommendations to you to stabilize and manage risks at various locations in the Vienna Mining District.

DEQ is also making the following site specific conclusions and recommendations:

Wisconsin Mill Waste

Mill waste samples WMSSS1 and WMSSS2 exceeded Human Health Screening Levels (HHSLs) for arsenic (by two times) and mercury (by more than 1.5 times). The sample also exceeded background levels for lead by over six times and mercury by over 1,000 times. Because of the proximity to the roadway and unrestricted access by users of the Vienna Town Site and dispersed campground, human receptors are likely to be exposed. The concentrations also exceed ecological risk benchmarks for all listed animal receptors.

Mercury concentrations in sediment deposited in Smiley Creek below the Wisconsin Mill Site exceeded Initial Default Target Levels (IDTLs) by 10 times. Given the recreational use of the old Vienna Town Site adjacent to the probable point of entry (PPE), remedial work to abate the erosion of mill wastes at the Wisconsin Mill Site is warranted. This might be accomplished by reinstallation of culverts up gradient from the site and regrading and capping existing wastes.

DEQ is recommending to EPA a Hazard Ranking Score be generated for this mill site and the owners work with DEQ to develop a reclamation or remedial action work plan to address the erosion and waste problems.

Webfoot Mine and Mill Waste

Metals concentrations in waste dump samples WFWD1MT1, UWFWD1SS1, and WF300LVSS1 exceeded HHSLs. Concentrations also exceed background conditions by greater than three times for antimony, arsenic, cadmium, lead, silver, zinc, and mercury. Concentrations of lead and zinc exceed "median values" for ecological receptors. Risks associated with these wastes would be significantly reduced if the waste were isolated, reclaimed, or removed.

DEQ is recommending to EPA a Hazard Ranking Score according to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) be generated for the Webfoot Mine. However, most human health risks associated with this site could be addressed by a Mine Safety and Health Administration (MSHA) required mine site safety and health plan. In addition, water management systems, reclamation of mine waste dumps, and a formalized water quality monitoring and evaluation plan should be incorporated into the plan of operations. If the owners/operators coordinate with DEQ on developing and implementing these plans, DEQ will recommend to EPA the site be designated as OCA (Other Cleanup Action) under DEQ's authority.

The Webfoot Mine discharge(s) to Smiley Creek are subject to regulation under Section 402 of the Clean Water Act which requires a National Pollution Discharge Elimination System Permit (NPDES) as administered by EPA. However, based on the "in-stream" water quality analysis, it does not appear significant loading occurs from the adit discharge or waste dumps, and there are

no violations of Idaho's Water Quality Standards. However, DEQ strongly suggests the operators design and implement a comprehensive water management system diverting adit water away from waste dumps and discharging to shallow infiltration systems into good soils and vegetated areas. DEQ also recommends surface water and adit discharge be routinely monitored at the Webfoot Mine according to a formal water quality monitoring plan.

The operators should consider the administrative options and perhaps EPA to ensure appropriate actions. EPA's program information may be found at:

http://cfpub.epa.gov/npdes/doctype.cfm?sort=name&program_id=45&document_type_id=8

Rebellion Tunnel Waste Rock

Waste dump sample RBWD1SS1 had total metals concentrations for arsenic, cadmium, lead, silver, and mercury exceeding IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic only slightly exceed benchmark values for all ecological receptors. Due to the remoteness (relative to humans) and the small portion for the natural range for ecological receptors, it is very unlikely there is human health or ecological risks associated with this mine site. DEQ is recommending to EPA this site be classified as No Remedial Action Planned (NRAP).

Hope and Solace Mine Waste Rock

Waste dump sample SMADSS1 had total metals concentrations for antimony, arsenic, cadmium, lead, silver, zinc, and mercury exceeding IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic, cadmium, and lead exceed benchmark values for all ecological receptors. Due to the remoteness (relative to humans), it is very unlikely human health risks exist at this mine site. There are concerns relative to the ecological risks to all receptor groups, particularly for elk, mule deer, and big horn sheep. Therefore, DEQ recommends to the site owner the waste dumps are isolated, reclaimed, or removed. However, DEQ also recommends to EPA this site be classified as NRAP.

Emma Mine Wastes

Waste dump sample UKADSS1 had total metals concentrations for arsenic, cadmium, lead, manganese, silver, and mercury exceeding IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic and lead exceed benchmark values for all ecological receptors. Due to the remoteness (relative to humans), it is very unlikely there is human health risks associated with this mine site. There are concerns relative to the ecological risks to all receptor groups, particularly for elk, mule deer, and big horn sheep. Therefore, DEQ recommends to the site owner the waste dumps are isolated, reclaimed, or removed. However, DEQ is recommending to EPA the site be classified as NRAP.

Vienna Mine Wastes

Waste dump sample VMWD2SS1 had total metals concentrations for antimony, arsenic, cadmium, lead, silver, zinc, and mercury exceeding IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic and lead exceed benchmark values for all ecological receptors. Although metals concentrations exceed IDTLs, HHSLs, and benchmark values for ecological receptors, it is very unlikely, due to the remoteness (relative to humans) and the current land uses, there are human health risks associated with this mine site. There are concerns relative to the ecological risks to all receptor groups, particularly for elk, mule deer, and big horn sheep. Therefore, DEQ recommends to the owner the waste dumps are isolated, reclaimed, or removed. However, DEQ is recommending to EPA the site be classified as NRAP.

Coleman Tunnel Waste Dump

In sample COWDSS1 total metals concentrations for arsenic, manganese, silver, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. None of the metals concentrations exceed benchmark values for all ecological receptors. Although metals concentrations exceed IDTLs, HHSLs, and benchmark values for ecological receptors, it is very unlikely, due to the remoteness (relative to humans) and the small portion for the natural range for ecological receptors, there are human health or ecological risks associated with this mine site. DEQ is recommending to EPA the site be classified as NRAP.

Cargill Mill Site Sediment

A sediment sample (SMCSD2) was collected on Smiley Creek in the Cargill Mill Site claim. Metals concentrations in the sample exceeded IDTLs, HHSLs, and background conditions by greater than three times for total arsenic, silver, and zinc. Although metals concentrations exceeded IDTLs and HHSLs, ecological benchmarks were not. Due to the remoteness of the location and limited current use, it is unlikely human health or ecological risks exist. However, as stated in discussion of the Webfoot Mine waste analyses, concentrations do suggest potential human health risks warrant protection of site workers and reclamation of the mine waste dumps. However, DEQ is recommending to EPA the site be classified as NRAP.

Lower Smiley Creek Sediment

A sediment sample (SMCSD1) was collected in the lower Smiley Creek meadows well below the mine sites, including the old Vienna Town Site. Metals concentrations in the sample exceeded IDTLs, HHSLs, and background conditions by greater than three times for total arsenic, manganese, silver, and mercury. No concentrations exceeded ecological benchmarks. Due to the remoteness of the location and limited current use, it is unlikely human health or ecological risks exist.

DEQ generated a very large amount of data and information regarding the Vienna Mining District. This information is contained in its entirety in the attached report. After you have had a chance to review the report, we would appreciate any questions or comments you may have. We hope we can coordinate with you or your tenants when you or they choose to act upon our recommendations, particularly during development and implementation of water management, reclamation, and environmental monitoring plans. Please do not hesitate to call me at (208) 373-0554 at any time regarding these issues.

Sincerely,

Bruce A. Schuld
Mine Waste Projects Coordinator

attachment

cc: Bill Allred – DEQ Twin Falls Regional Office
Ken Marcy – U.S. EPA, Region 10
Maggie Baker – USDA National Forest Service, Region 4
Jeff Gabardi – USDA Sawtooth National Forest, Twin Falls
PA Program File

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List of Acronyms

amsl	above mean sea level
bgs	below ground surface
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability 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
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
SNRA	Sawtooth National Recreation Area
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 the Vienna 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 such potentially contaminated sites. Due to accessibility and funding considerations, priority is given to sites where potential contamination poses the most substantial threat to human health or the environment. In recent years this priority focuses 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 Vienna 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 Vienna Mining District is located around patented and unpatented mining claims on federal lands administered by the United States Forest Service (USFS) (Figure 1).

The Vienna Mining District contains numerous mine and mill sites, the largest of which is actually the Web Foot Mine, not the Vienna Mine. The mines and mills in the Smiley Creek drainage are located on 44 patented mining claims and 8 unpatented mine and mill site claims.

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 Vienna Mining District written by Clyde P. Ross of the Idaho Bureau of Mines and Geology (1927), Spencer S. Thornton of the Idaho Bureau of Mines and Geology (1971), and Victoria E. Mitchell of the Idaho Geological Survey (2009). IDEQ could not improve or expound upon these reports by writing additional historical or geological text, therefore they were directly referenced and cited.

Access to a majority of the mining claims located in the Vienna Mining District was given by Allen Jones of Terrawiggly LLC and Mrs. Marti Arvey of who represents the William D. Arvey Trust that owns the Hope patented claim. Terrawiggly LLC shares ownership with numerous other private parties on a number of claims and, at Mr. Jones suggestion, DEQ attempted to get permission from the co-owners. In a second round of correspondence requesting access DEQ

notified the co-owners of DEQ's activities on Terrawiggly (sole ownership) lands and the purpose of DEQ's Preliminary Assessment Program.

DEQ visited the Vienna Mining District during the week of September 13 – 17, 2010. 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 the conclusions discussed in this report.

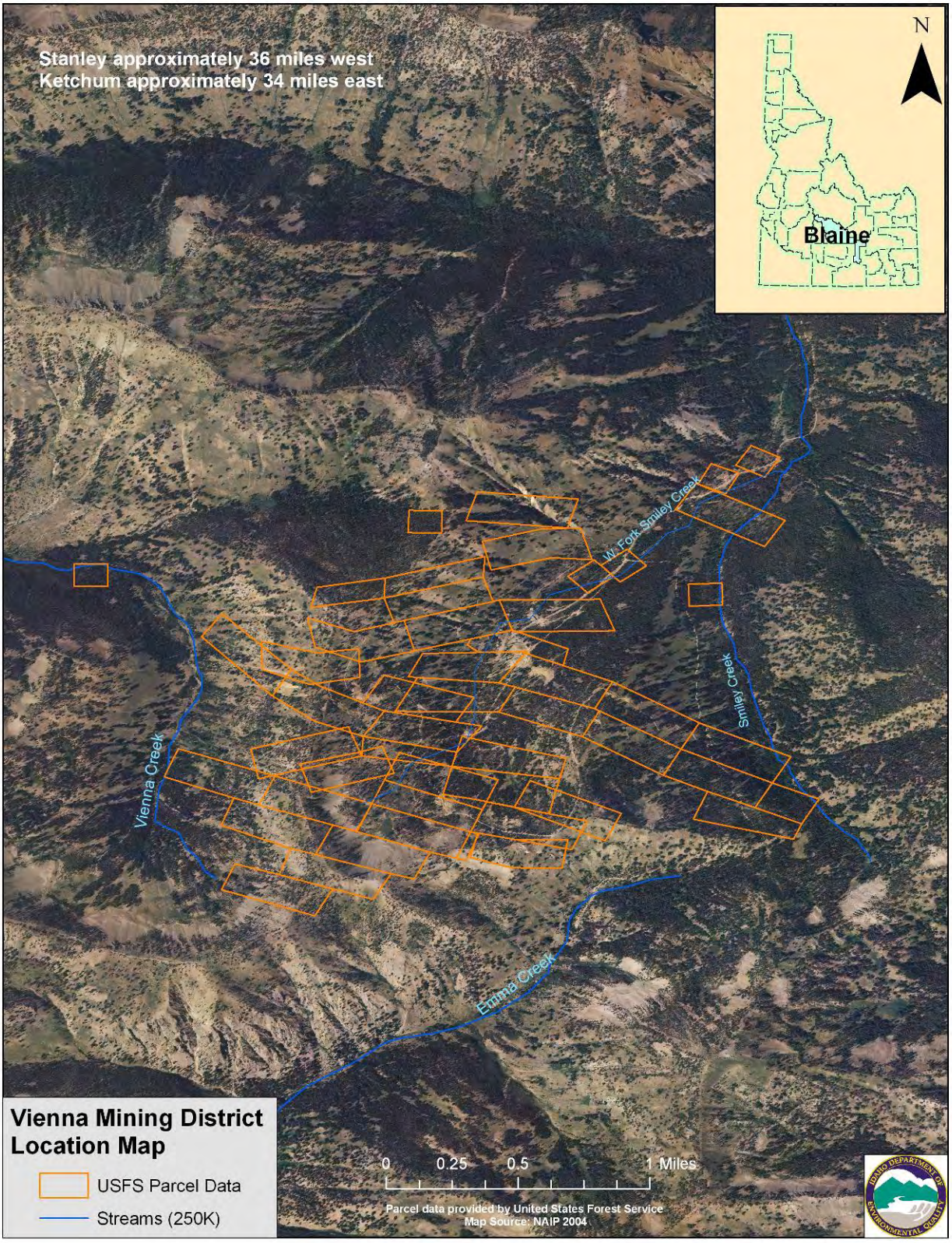

Figure 1. Location Map

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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 Blaine County Recorder's Office, USDA Forest Service, the U.S. Department of Interior – Bureau of Land Management GLO Records, and the representative of Terrawiggly LLC.

Figure 2 is an aerial photo overlain by claim boundaries and names of assessed properties in the Vienna Mining District. The property boundaries east and west are disproportionate relative to those north and south. This is caused by a distortion in the photo itself. However, the actual features photographed and the property corners overlain are accurately depicted on the landscape. This distortion is the reason there is no scale placed on the figure.

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 indicate 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 that 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 affects to human or ecological receptors. These conclusions and recommendations are contained in the final section of this report.

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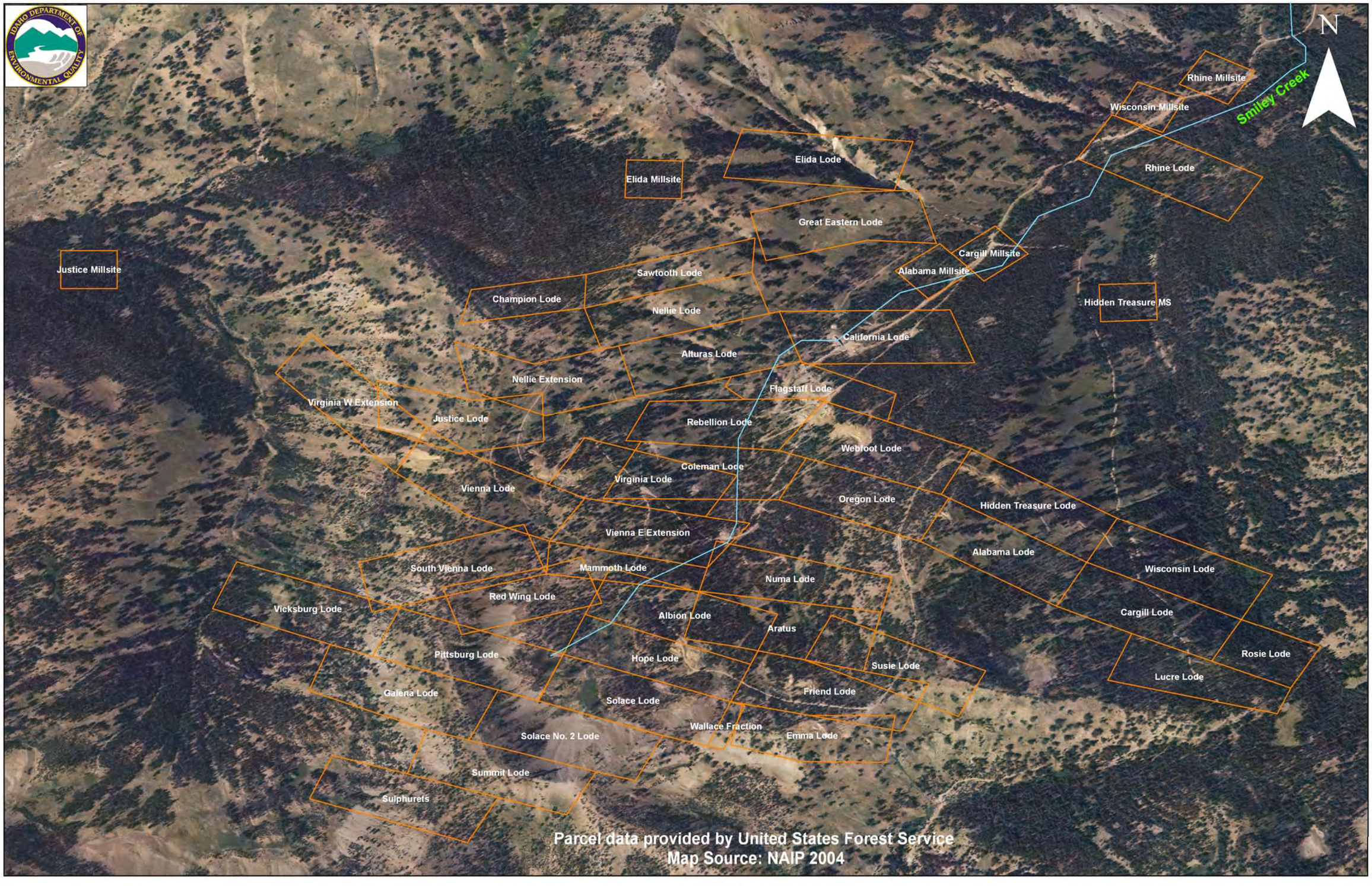

Figure 2. Orthophotoquad and Claims Boundaries.

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Table 1. Vienna Mining District Mines, Mills, and Ownership

Parcel Number	Owner	Mine/Mill Site Claim	AKAs	Township	Range	Section	Latitude (N)	Longitude (W)	DEQ Status
N/A	Terrawiggly LLC c/o Allen Jones Smiley Creek Lodge HC 64 Box 9102 Ketchum, ID 83340	Wisconsin Mill	Wisconsin Mill Site Rhine Mill Site Rhine Lode	5N	14E	6	43.813890	114.830840	Calculate HRS Recommend Reclamation Plan
RP1M0000000160	Terrawiggly LLC c/o Allen Jones Smiley Creek Lodge HC 64 Box 9102 Ketchum, ID 83340	Webfoot Mine and Mill aka Mountain King Mine aka Mountain King Mill	California Lode Flagstaff Lode Alabama Lode Webfoot Lode Oregon Lode	5N	14E	6	43.802600	114.843390	Calculate HRS Recommend Reclamation Plan and Worker Health and Safety Plan.
N/A	Terrawiggly LLC c/o Allen Jones Smiley Creek Lodge HC 64 Box 9102 Ketchum, ID 83340	Numa Tunnel aka Solace Group	Numa Lode	5N	13E	1	43.802280	114.846660	NRAP
RP1M0000000170	Terrawiggly LLC c/o Allen Jones Smiley Creek Lodge HC 64 Box 9102 Ketchum, ID 83340	Vienna Mine aka Vienna Group	Red Wing Lode Vienna Lode Vienna East Ext. Lode South Vienna Lode Vienna West Ext. Lode Virginia Lode	5N	13E	1	43.804520	114.852870	NRAP
N/A	Terrawiggly LLC c/o Allen Jones Smiley Creek Lodge HC 64 Box 9102 Ketchum, ID 83340 William D. Arvey Trust c/o Marti Arvey 101 S. Hiawatha Dr. Hailey, ID 83333	Solace Mine Aka Solace Group	Solace Lode Solace No. 2 Lode Hope Lode	5N	13E	1	43.794680	114.847770	NRAP
N/A RP1M0000000980	Terrawiggly LLC c/o Allen Jones Smiley Creek Lodge HC 64 Box 9102 Ketchum, ID 83340 Rego F. Alfredo Box 2358 Sun Valley, ID 83353	Emma Mine	Friend Lode Susie Lode Aratus Lode Albion Lode Emma Lode Wallace Lode Fraction	5N	14E	6	43.794010	114.843970	NRAP

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

Parcel Number	Owner	Mine/Mill Site Claim	AKAs	Township	Range	Section	Latitude (N)	Longitude (W)	DEQ Status
N/A	Terrawiggly LLC c/o Allen Jones Smiley Creek Lodge HC 64 Box 9102 Ketchum, ID 83340	Coleman Tunnel	Coleman Lode	5N	13E	1	43.804180	114.847690	NRAP
		Rebellion Tunnel	Rebellion Lode	5N	13E	1	43.805410	114.849240	NRAP
		Nellie Ext. Tunnel	Nellie Ext. Lode	6N	13E	36	43.804210	114.853300	NRAP
			Justice Lode	6N	13E	36	43.804300	114.853500	NRAP
		Cargill Mill	Cargill Mill Site	6N	14E	31	43.808900	114.838120	NRAP
		Alabama Mill	Alabama Mill Site	6N	14E	31	43.807780	114.939140	NRAP
		Hidden Treasure Mill	Hidden Treasure Mill Site	6N	14E	31	43.807580	114.833270	NRAP
N/A	Terrawiggly LLC c/o Allen Jones Smiley Creek Lodge HC 64 Box 9102 Ketchum, ID 83340 Jean Todhunter Charles & Ann B. Dunn c/o Linda Bartholomew Box 2413 Eagle, ID 83616 Mary Jane Kershner Gary Peck North Johns Ave. Emmett, ID 83617 Wayne Stanley 5425 Santa Cruz Ave. Richmond, CA 94804	Champion		6N	13E	36	43.806700	114.853710	NRAP
		Sawtooth		6N	13E	36	43.806310	114.852160	NRAP
		Nellie		6N	13E	36	43.805730	114.851750	NRAP
		Elida		6N	14E	31	43.811590	114.843930	NRAP
		Great Eastern		6N	14E	31	43.808800	114.841290	NRAP
		Elida Mill Site		6N	13E	36	43.811400	114.848380	NRAP
		Elsie		6N	14E	31	43.808320	114.840350	NRAP
		Alturas		6N	13E	36	43.805680	114.844870	NRAP
N/A	Terrawiggly LLC c/o Allen Jones Smiley Creek Lodge HC 64 Box 9102 Ketchum, ID 83340	Rosie Lode		5N	14E	6	43.795000	114.827530	NRAP
		Wisconsin Lode		5N	14E	6	43.796100	114.830360	NRAP
		Lucre Lode		5N	14E	6	43.794480	114.828740	NRAP
		Cargill Lode		5N	14E	6	43.796290	114.831710	NRAP
		Alabama Lode		5N	14E	6	43.798830	114.837850	NRAP
		Harrisburg Lode		5N	13E	1	43.799810	114.866330	NRAP
		Vicksburg Lode		5N	13E	1	43.795750	114.858230	NRAP
		Galena Lode		5N	13E	1	43.793750	114.854790	NRAP
		Pittsburg Lode		5N	13E	1	43.795320	114.854380	NRAP
		Summit Lode		5N	13E	1	43.790870	114.852430	NRAP
		Sulphurets Lode		5N	13E	1	43.790090	114.857350	NRAP

Section 3. Overview and Location

The Vienna Mining District is located in the headwaters of Smiley Creek, also known as Smiley Canyon. Smiley Creek is a tributary to the Salmon River. The Vienna Mining District is also located adjacent to the Sawtooth National Recreation Area. The Sawtooth National Recreation Area (SNRA) is a National Recreation Area designated for the protection of recreational values in the Boise, Sawtooth, and Salmon national forests, and includes the Sawtooth Wilderness. It is administered by the Sawtooth National Forest out of Ketchum and Stanley, Idaho. The area covers approximately 778,000 acres.

To get to the mines take Forest Service Road 077 or 077A west from Highway 75, also known as the Sawtooth Scenic Highway. The junctions of these roadways are just north and south of Sawtooth City and the Smiley Creek Lodge. Interested parties should be aware the USGS topographic maps incorrectly depict the location of the Vienna Mine. The Vienna Mine is mapped where the Emma claims are located and not on the Vienna West Extension and Vienna Mine as it should be.

Photo 1. Looking north along Highway 75 towards Sawtooth Mountains and Stanley. (Photo by Schuld 9/13/10)

The small village of Smiley Creek, aka Sawtooth City, sits in the southern portion of the Stanley Basin at the mouth of Smiley Creek and near the headwaters of the Salmon River. Smiley Creek has approximately 24 full time residents, a number of seasonal recreational residents and service personnel, an airport, and a community drinking water supply.

Photo 2. Smiley Creek, aka Sawtooth City, sits in the southern portion of the Stanley Basin at the mouth of Smiley Creek and near the headwaters of the Salmon River.(Photo by Schuld 9/13/10)

Photo 3. Smiley Creek Lodge. (Photo by Schuld 9/13/10)

The Smiley Creek Watershed drains northwest to the Salmon River. The upper reaches of the watershed has spectacular views of the Boulder and White Cloud Mountains to the east, Salmon and Sawtooth Ranges to the north, and Smoky Mountains to the south. Castle Peak in the Boulder/White Clouds is a prominent landmark.

Photo 4. Looking east to the Boulder and White Cloud mountains and Castle Peak. (Photo by Schuld 9/13/10)

A small mountain lake nestled against the upper arête of the Smiley Creek drainage provides the perfect location to obtain background samples for sediment, soils, and surface water (samples SMCBGSD1, SMCBGSS1, and SMCBGSW1).

Photo 5. Mountain lake beneath arête of the Smiley Canyon. (Photo by Schuld 9/14/10)

Photo 6. Tina Elayer collecting field parameters for surface water background sample. (Photo by Schuld 9/14/10)

Photo 7. Soil sample SMCBGSS1 was collected at approximately Lat. 43.80418ºN, Long. 114.84769ºW. Note the high volume of organic materials not normally found in the area's soils. (Photo by Schuld 9/14/10)

Although access to an area above most of the workings was easily negotiable, DEQ found, and later verified, many of the richest ore deposits in the Vienna Mining District outcrop all of the way up to the tops of the ridge lines. Therefore, it was expected background concentrations of all metals are likely to be high.

Photo 8. The Smiley Creek drainage, including Vienna Creek, flow through a large U-shaped glacial valley. (Photo by Schuld 9/13/10)

Photo 9. Lower Smiley Creek is a very mature (braided) perennial stream bordered by very lush alder-willow-dogwood riparian communities. (Photo by Schuld 9/13/10)

Photo 10. Tina Elayer collecting field parameters on Smiley Creek (sample SMCSW1) approximately ½ mile below Vienna mines; Lat. 43.84101º N, Long. 114.81689º W. (Photo by Schuld 9/14/10)

Section 4. Mine Site History

DEQ utilizes historical research for several purposes. Initially historical information highlights potential contaminants of concerns, the magnitude of waste sites, and potentially dangerous physical hazards such as open adits and shafts. DEQ also uses the information to properly identify mine and mill facilities, unravel inconsistencies that may exist in property boundaries and ownership, and historical land uses that coincide with mining.

The following section contains historical information, for the purposes discussed above, partially excerpted from reports written by Ross (1927), Shannon (1971), and Mitchell (2009). The excerpted information is presented in this section only to provide the reader with some of the same background information as was utilized in the assessment of these properties. The reader is referred directly to those historic accounts for the entire presentation.

Spencer S. Shannon Jr. of the Idaho Bureau of Mines and Geology reported in the *Geology and Geochemical Exploration of the Vienna District, Blaine and Camas Counties"* (1971) that:

> *Silver ore was discovered in the Vienna district in 1878 (Idaho Historical Society, no date, p. 19). The first claims staked were the Pilgrim on Beaver Creek (Campbell, 1921, p. 23) and the Emma near the head of Smiley Creek (Burchard, 1883, p. 218).*
>
> *Towns sprang up at Vienna on Smiley Creek and at Sawtooth on Beaver Creek to house the miners; in its heyday, each town claimed a population of 1,000.*
>
> *Small shipments hand-cobbed ore were packed to the Buffalo mill in Atlanta (d'Easum, 1962, p. 4) and to a smelter in Salt Lake City, Utah, (Strahorn, 1881, p. 59) in 1880.*
>
> *Three mills operated in the Vienna district during the silver boom. The Columbia and Beaver Co. constructed a 20-stamp, chlorination mill near Sawtooth (Burchard, 1883, p. 212…….Most of the ore for the mill was supplied by the Silver King and Pilgrim Mines. In 1883, a 30-ton stamp and chlorination mill was built 0.5 mile south of Vienna (Burchard, 1884, p. 448), and bullion valued at $103,600 was produced from ore from the Mountain King Mine (Umpleby, 1915, p. 247). In 1884, bullion valued at $200,000 was produced from ore from the Vienna Mine (Burchard, 1885, P. 263). A 30-ton concentrator was erected at the Silver King Mine in 1884 (Burchard, 1885, p. 263).*
>
> *The mines in the Vienna district shut down prior to the silver panic of 1893. Umpleby (1914, p. 247) reported that Vienna was an active mining camp until 1885.The Silver King Mine operated until 1888 (Umpleby, 1914, p. 249); when it closed most of the inhabitants of Sawtooth moved away.*
>
> *The Vienna, Silver King, and Pilgrim Mines have been reopened several times since 1890. Several carloads of ore were shipped from mines of the Vienna group between 1915 and 1917 (Bell, 1915, p. 57; Bell 1917, p. 56). Ore was produced from mines of the Vienna group during 1933 to 1943 (Minerals*

Yearbook, 1933-1943). A 75-ton flotation mill was built in 1934 to treat the Vienna ores (Simons, 1934, p. 93). The Silver King Mine was operated from 1937 to 1941 (Minerals Yearbook, 1937-1941); ore from this property was concentrated in a 40-ton ball mill and flotation Webfoot, Silver King, and Pilgrim plant (Campbell, 1942, p. 93). Small lots of high-grade silver ore were shipped from the Pilgrim Mine in 1940 (Minerals Yearbook, 1940, p. 340).

Efforts were made to dewater the Silver King Mine during the summers of 1961 and 1962.

Most of the output of silver ore from the Vienna district was during the period from 1880 to 1889; production data for the decade are meager and fragmentary. Umpleby (1914, p. 247 and 249) estimated that, prior to 1912, ore and bullion valued at about $1 million were shipped from the mines near Vienna and ore and bullion valued at nearly $1 million were shipped from the mines in the Sawtooth district (Beaver Creek, Eureka Gulch, and. Jakes Gulch). Most of the ore was produced from the Vienna, Mountain King or Mines. Virtually all the ore produced since 1912 has come from these properties. Production from the district from 1912 to 1932 was small and discontinuous. Since 1933, 4,569 tons of ore valued at $63,149 have been shipped from the Vienna district.

Although there were numerous mine and mill sites in the district only a few (Webfoot, Vienna, Solace, and Vienna Group) were discussed at length in historical writings, particularly Victoria E. Mitchell's *"History of Mines in the Smiley Creek Area of the Vienna Mining District, Blaine and Camas Counties, Idaho"* (Idaho Geological Survey, 2009) which contained the following information:

VIENNA MINE

Levi Smiley first prospected the Vienna area in 1879 (Wells, 1983). The earliest discoveries were reported in 1879 (Umpleby, 1915). E. M. Wilson discovered the Vienna Mine on June 4, 1879. (See Table 1 for individuals and companies operating at the mine.) Before long, the mine was sold to investors from LaCrosse, Wisconsin, and Winona, Minnesota (Wells, 1983). Concerning early development at the mine, Wells (1983, p. 111) noted:

> *The development of the Vienna mine, while less extensive than all of Sawtooth's properties, had justified construction of a major mill. A 7-foot vein of $200 ore (but with assays as high as 19,000 ounces of silver a ton running far above this average) was exposed by two upper tunnels each of which ran 275 feet to reach the Vienna lode. A tunnel was driven to provide access at a depth of 500 feet below the Vienna outcrop. While all this exploration was under way between 1880 and 1882, a twenty-stamp mill was completed in 1882. Built to precisely the same specifications as the highly productive Custer mill on Yankee Fork and installed by the same contractor, this plant exceeded $200,000 in cost. Production had to be delayed until the next season for lack of mill supplies when winter snow isolated Vienna and Sawtooth for another season.*

Strahorn (1881, p. 59) described the workings in more detail:

> *Three tunnels of from 250 to 400 feet each, and a number of other openings have been made upon the vein, and some 600 tons of ore, worth from $100 to $500 per ton, have been produced in the course of this simple development*

> *work, while two thousand tons equally good are blocked out in the mine. One shipment of twenty tons to Salt Lake last fall yielded $400 to the ton, while several smaller shipments did considerable better. The vein is two to seven feet wide, and there are streaks in it worth $2,000 per ton.*

The following year, the mine was steadily producing very high-grade ore. Several hundred tons of ore had been mined and were awaiting milling. A tunnel had been driven to the ledge and afterward continued along the vein about 300 feet, opening some rich ore. A strike made in a raise off the main tunnel added materially to the value of the mine. In 1883, the Vienna Mine was still yielding steadily, and the ore was of even better quality than previously. The yield was estimated to be $25,000 a month. The Vienna Mining and Milling Company employed about one hundred and twenty men for the entire year in 1884. (See Figure 10 for a picture of the town of Vienna at this time.) During the year the mine was estimated to have shipped probably $200,000 worth of bullion.

The Vienna Mine was shut down in 1886. In 1888, a $60,000 development tunnel, driven through to the South Fork of the Boise River face of the ridge, failed to produce any ore. After the mine was sold at a sheriff's auction in 1906, lessees did a little work in 1912 (Wells, 1983).

WEBFOOT MINE

The Webfoot Mine was originally called the Mountain King. Exactly when it was discovered is not known, but it was apparently one of the early discoveries in the area. Strahorn (1881, p. 59) provided the following information about the mine:

> *Near the Vienna is the Mountain King, next to the Custer probably the most promising mine in all Idaho. The vein has been located for a mile. It projects above the surface two to seven feet, and is from eight to sixteen feet wide, five feet of which is ruby and sulphuret ore, worth $200 to $800 silver, and $8 to $12 gold per ton. Nearly 800 tons of rich ore are on the Mountain King dump, with hundreds of thousands of dollars worth in sight in the various openings. About 100 tons shipped to Salt Lake this year yielded $240 per ton. Excepting the Custer this is the largest outcrop of very high-grade ore I have seen, and its granite walls are so well defined it seems almost certain that it will maintain its present proportions and probably its richness. The Mountain King is being systematically developed under the able direction of Chris. Johnson, Esq., superintendent, who is also superintendent of the Vienna. A twenty-stamp mill will be erected early in 1882 to work Mountain King ores, when we may safely look for a product of from $50,000 to $75,000 per month. The Alturas, Lucre, Justice and Wisconsin claims [Figure 4], all believed to be on the Mountain King vein, are being developed, and promise good things for the immediate future.*

In 1882, the Mountain King had two tunnels about 100 feet vertically apart and a total length of about 350 feet. About 1,700 tons of ore had been mined or was in sight. This ore ran from 75 to 100 ounces of silver per ton. Contradictory reports from the next year said that the ores of the mine had not exceeded 20 ounces of silver per the ton in preceding years, but the vein had improved to show a foot of ore which ran nearly 30 ounces of silver per ton. The production for 1883 was 74 bars, valued at $103,600. There is no further mention of activity at mine, which means that it probably was closed. By 1896, the mine was definitely idle (Lindgren, 1900).

In 1912, the Mountain King shipped lead sulfide ore carrying considerable sold and silver. The following year, the Webfoot property shipped a car of galena carrying gold and silver values to Salt Lake City.

SOLACE MINE

The Solace was discovered in July 1881 and sold within sixty days for $40,000. The discovery was a 4-foot vein of sulphurets and antimonial silver, worth from $100 to $2,000 per ton (Strahorn, 1881). Describing the veins in more detail, the 1882 Director of the Mint Report (DotMR) noted:

> *The Solace Mine has been considerably explored. A tunnel was started to tap the main ledge, but in advancing a vein was cut which was supposed to be the main vein, but in raising from the tunnel level to the surface it proved to be a blind vein carrying very rich ore. Upon further advancing the tunnel the main vein was struck at a depth of 120 feet from the surface, showing very high-grade ore. Thirty tons from this mine were sold last season, realizing $10,000. Reduction works will be erected in 1883 in connection with this mine.*

In 1883, the Solace Mine was owned by J. B. Haggin of San Francisco and other men, including one of the Hearst family. The mine produced no bullion during the year, but had a large quantity on the dump. The mine had a large amount of high-grade ore. There were no further reports of activity at the mine. By 1896, the mine was definitely idle (Lindgren, 1900).

VIENNA GROUP

After about 1915, the Vienna, Solace, and Webfoot mines were collectively referred to as the Vienna Group. Shannon (1971, p. 17) attributes the first discussion of the Vienna Group to the Idaho Inspector of Mines: "The Vienna group includes the old Vienna Mine across Smiley Creek canyon from the Webfoot Mine; since 1912 (Bell, 1912, p. 86), virtually all output of the Vienna group has come from the Vienna Mine." However, Bell does not discuss which claims the Vienna Mine controlled in 1912 (1912 IMIR, p. 86-87):

> *Another interesting point of ore development was made in the old Vienna Mine near the head of the Salmon River in the north corner of Blaine County during the past year.*
>
> *This property embraces a very extensive group of patented claims on which a very large amount of development was done in early days that yielded an output of over a million dollars in gold and silver.*
>
> *One of the old tunnels has been reopened and retimbered and discloses a wide fissured and sheared mineral zone in granite containing rich streaks of lead-silver and gold bearing material in quartz, from which three carloads of hand sorted ore were shipped during the year containing an average value of $50.00 per ton.*
>
> *The ore bodies on this property are associated with porphyry intrusions and are of great size and lineal extent and contain some excellent values, varying from $5.00 to $50.00 per ton, and in widths of from 5 to 10 feet and over.*
>
> *This property was worked at a time when the supplies had to be freighted by wagon from Corrinne, Utah, a distance of over 300 miles and only the choicest milling ores were extracted, leaving the base lead ore which contains some antimony.*

> *It is believed from the size of the dumps of low grade now in evidence at several extensive tunnels in the property that the former owners avoided the smelting mineral as much as possible, as their method of treatment was by stamp milling and pan amalgamation for the recovery of the gold and silver values, and that there remains in the property an extensive tonnage resource which, by first concentrating the smelting mineral out, could then be treated by modern chemical means for the recovery of the gold and silver values and form the basis of a very large mining and milling operation.*

Despite Shannon's incorrect attribution, U.S. Bureau of Mines production records indicate production had shifted to the Vienna Group as a whole by 1915 at the latest. The Idaho Mines Inspector reported the Vienna Group was composed of the Webfoot, Solace, Emma, and Lion claims. Umpleby (1915, p. 248-249) described the Mountain King (Webfoot) workings, which were the only ones open when he visited the district:

> *At the time of the writer's visit only the Mountain King workings were accessible. They had recently been cleaned out in part by a group of men who held three claims of the Vienna group under bond and lease, and who were seeking lead-silver ores in the old silver-quartz stopes. This is said to be the only mine in the district which contains important amounts of lead ores, and as lead was not desired in the chlorination mill owned by the old company it was not removed from the mine. The ore occurs along a crushed zone that strikes N. 60º W. and dips 51º NE. in the upper levels and 800 in the lowest or No. 4 level. Development comprises about 6,000 feet of work in four drifts on the vein. As shown by the old stopes the ore body was about 700 feet long and ranged in width from a few inches to 15 feet, probably averaging about 4 feet. It is said that material from these stopes averaged between 20 and 30 ounces of silver to the ton and contained a noteworthy amount of gold. The best lead ore was found on level No. 3 near raise No. 9, where a small vein which strikes N. 40º E. intersects the main lode. The silver-quartz ore occurred as a band 8 to 20 inches wide alongside the galena ore, either next to the hanging wall or next to the footwall. Both sorts of ore show abundant evidences of replacement of crushed granite. Next to the vein, pyrite as isolated cubes and stringers is developed in the granite, and sphalerite and galena replace blocks of wall rock within the fissure. The granite is intensely sericitized adjacent to the fissure, and locally chlorite is abundantly developed. The lead ore is irregularly distributed along the fissure and ranges in width from 1 inch to 6 feet.*

The Idaho Mines Inspector described the area later in the year (1915 IMIR, p. 74):

> *Near the head of Wood River 25 to 30 men were employed during the last half of the year in a resumption of operations at the long idle former bonanza silver ore deposits of the Vienna district, where recent reports indicate the uncovering of a considerable tonnage of good lead-silver ore that was left by former operators, who handled the property with a pan process silver mill for its rich silver and gold values, which were conspicuous for their bonanza tenor in the early operations of these veins over 25 years ago. The management of this enterprise is finding indications and is hopeful of developing further reserves of the rich silver ore values for which the veins were formerly noted in addition to the lead smelting minerals that were left by the former operators and from which several car load shipments have been made.*

The Vienna Consolidated Mines & Smelting Co. held the mine in the early 1 920s but did no mining after 1918. A. F. Peery, operating the Vienna Mine under a lease, shipped one car of rich silver ore from the mine in 1925 and conducted development work throughout the year. Peery continued to develop the mine from 1925 until 1930. In 1927 he found some excellent high-grade silver ore. In 1929, the Vienna Group produced a test shipment of lead ore containing considerable silver. Development work for the year was about 500 feet of drifting and 150 feet

of raising. This work opened a good showing of high-grade silver. In addition, Peery installed complete mining equipment and a compressor driven by a Diesel engine. In 1930, Peery ran an active development program during the early and latter parts of the year.

The Idaho Mineral Products, Ltd., developed the Vienna Group throughout 1931, installed new milling equipment, and began milling operations in December. This company, in cooperation with the Idaho State Highway Department, opened Galena Summit to motor vehicle travel in December so that the company could complete storing winter supplies. The property had a gas-driven jig concentrator and a 75-horsepower Diesel engine driving compressor.

Idaho Mineral Products maintained active development work throughout 1932, and also remodeled and modernized its mill. Average employment was seven men. The company continued to operate the Vienna Mine in 1933 and treated about 2,600 tons of lead ore in the new 75 tons-per-day (tpd) flotation mill. Lead concentrates rich in silver and gold were shipped to Midvale, Utah, for smelting. Development work with a crew of 10 men showed excellent results. The company was reorganized and new capital was provided during the second half of the year. Plans called for working thirty-five men throughout the winter. Heinecke (n.d., p. 30) quoted a letter describing the 1933 work:

On September 20, 1933, Idaho Mineral Products Co. sold the Vienna Group to the Ruby Queen Silver Mines Corp. The sales contract was cancelled June 30, 1934, for failure to fulfill its terms.

Kimball Mining Syndicate leased the Vienna mine in 1935.

The property was idle in 1936, 1937, and 1938.

Idaho Mineral Products Co. was in process of reorganization during 1937.

The Vienna Mine was the chief producer in the district in 1939. A lessee shipped several cars of siliceous ore to smelters in Utah. In 1940, lessees shipped crude gold and gold-silver ore. About 35 tons of gold-silver ore was shipped in 1941.

On Oct. 8, 1942, War Production Board Limitation Order L-208 closed all non-essential mines for the duration of World War II. Nevertheless, in 1944 a lessee worked the Vienna Mine and shipped 80 tons of high-silica gold-silver ore to a Utah smelter.

Heinecke (n.d., p. 4-5) reported the following on the history of the property between 1955 and 1985:

> *In 1955, Heinecke Brothers obtained a lease from the Northern Trust Company, trustee for the estate of Lewis Hippach. Herman Heinecke had worked at the mine in 1934 when Mercer and Williams were the operators and knew of the great potential of the mine. Heinecke Brothers shipped 600 tons of flux ore from the dump at level #200 and did some open cut stripping near the #200 adit where the vein comes to the surface.*
>
> *In 1959, Homestake Mining Company was involved with efforts to get through a cave-in 800 feet from the portal of level #400 but this effort failed and work was again stopped.*
>
> *Western Gold Corporation did some diamond drilling at the same location and results of drilling showed 8 feet of ore that assayed 15 to 20 oz silver per ton.*

In 1962, Heinecke Brothers assigned the Vienna lease to the Vienna Silver Mines Company and received stock for their interest. During the following 10 years, old adits were opened, access roads were built and equipment was purchased for building a floatation mill on the property. About 800 tons of flux ore was produced from dumps and an open cut near #200 adit. A heavy media plant, using a Cedar Rapids crushing plant and jig and table, was tested on the #400 dump, but was not put into full operation before lack of financing caused the work to stop.

In 1968, a sub-lease was given to Silver Empire Mining Company and they subsequently drove a new adit 200 vertical feet below the #400 level. Considerable mineralization was encountered in the #600 level but lack of finances caused exploration activities to cease before ore development was accomplished. Silver Empire lease was terminated and full control of the 36 patented mining claims reverted back to Vienna Silver Mines.

No significant work was done on the Webfoot mine until 1983, when Cash Industries, Inc. signed a Management Contract with Vienna Silver Mines. During 1983 and 1984, some limited drilling was performed by Cash Industries, the results of which served as the basis for the exploration program described later in this report.

After Cash Industries, Inc. went into bankruptcy and was liquidated in 1985, Rothschild Mining Corporation staked the 16 unpatented claims after it had negotiated an agreement with option to purchase for the 36 patented claims.

Rothschild's 1986 or 1987 exploration program at the Vienna Group was successful, and mining was scheduled to begin the following spring. In 1988, Rothschild continued its exploration program. The company completed a raise in the mine and stockpiled ore at the Webfoot Mine. Several test batches of ore were run through the company's mill west of Ketchum.

In 1989 and 1990, Earl Waite worked the Webfoot mine. In 1991 Rothschild Corporation did underground drilling and exploration at the mine. The mine was idle in 1992 and 1993.

At the end of 1994, Aurtex, Inc., leased the Vienna district mines. In 1995, Aurtex started a surface evaluation of the mines for their gold potential. Sixteen excavator trenches were dug in mineralized areas of the old workings. The trenches were mapped and sampled, then reclaimed. Aurtex planned surface drilling and perhaps underground mapping for 1996.

Total recorded production from the Webfoot Mine for the years 1908 to 1913 and the year 1981 is 125 tons of ore. This material yielded 145 ounces of gold, 1,907 ounces of silver, 137 pounds of copper, 35,725 pounds of lead, and 1,768 pounds of zinc. Total recorded production from the Vienna Group from 1915 to 1977 is 5,009 tons of ore. This material yielded 904 ounces of gold, 84,451 ounces of silver, 3,165 pounds of copper, 93,088 pounds of lead, and 1,968 pounds of zinc. These numbers must be considered a bare minimum, because there is no accurate record of the amounts of ore or metals produced by any of the three mines before 1900. No post-1900 record of production from the Solace Mine appears to exist, but all twentieth century production from the mine may have been recorded as part of the Vienna Group.

The Vienna Mining District also has a lot of recent history not reported in previous historical writings, most notably its location for scenes in the movie "Pale Rider." However, a large

amount of exploration work and modifications to waste piles occurred outside of mine inspector reports or more recent historical descriptions.

Section 5. Climatology

The upper Salmon River Basin, specifically in the area surrounding the Vienna Mining District has a subarctic climate with short, cool, dry summers (Shannon 1971). Climatologic information and data are collected at the Vienna Mine Natural Resources Conservation Service SNOTEL Site 845. The following tables summarize climatic conditions in the area.

SNOTEL Site: Vienna Mine
State: Idaho
Site Number: 845
County: Camas
Latitude: 43 deg; 48 min N
Longitude: 114 deg; 51 min W
Elevation: 8960 feet
Reporting since: 1978-10-01

Period of Record Monthly Climate Summary

Period of Record: 6/ 1/1919 to 7/31/1962

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	27.6	33.1	39.2	47.1	57.6	65.8	77.2	75.9	67.2	55.7	40.5	29.9	51.4
Average Min. Temperature (F)	0.9	4.2	8.9	19.0	27.3	31.9	36.4	34.3	28.0	22.0	12.2	4.2	19.1
Average Total Precipitation (in.)	1.60	1.42	1.43	1.06	1.29	1.11	0.56	0.66	0.87	1.09	1.53	1.79	14.40
Average Total Snow Fall (in.)	16.4	12.9	12.5	4.1	0.9	0.1	0.0	0.0	0.1	1.6	9.6	16.2	74.6
Average Snow Depth (in.)	21	28	29	18	1	0	0	0	0	0	4	12	9

Percent of possible observations for period of record.

Max. Temp.: 97.8% Min. Temp.: 97.8% Precipitation: 98.1% Snowfall: 81% Snow Depth: 91.9%

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Section 6. General Geology

As in the Mine Site History (Section 4), DEQ could not add to nor improve upon the geologic analysis or information provided by Ross (1927), Shannon (1971), or Mitchell (2009). For the edification of the reader's perspective on the area and the importance to mineral developments, waste generation, toxicology, transport, and exposure mechanisms DEQ has selectively excerpted sections from those reports. Shannon (1971) includes the best summary of geologic aspects as presented here:

> *LITHOLOGIES*
>
> *Wood River Formation*
>
> *The Wood River Formation consists of metaquartzites and calc-silicate granofelses that crop out in a narrow belt extending from Vienna northwestward to the lower reach of Beaver Creek. The base of the Wood River Formation is not exposed in the Vienna district. Within the map area, the Wood River rocks are overlain unconformably by volcanic rocks of Tertiary age and are in fault contact with quartz monzonite of Cretaceous age. During the intrusion of the Idaho batholith, the metaquartzites were formed by contact metamorphism from preexisting quartzites, and the granofelses were formed by contact metamorphism from limestones and dolomites.*
>
> *The metasedimentary rocks of the Wood River Formation are white to medium gray, massive to bedded, graphite or muscovite metaquartzite, and orthoclase-diopside or epidote-wollastonite-quartz granofels. Weathered specimens range from pinkish gray to moderate brown or moderate yellowish orange. The metaquartzites are fine grained and have granoblastic texture. The muscovite metaquartzite has a weak schistosity parallel to the bedding. The metaquartzites contain 75 to 90 percent xenoblastic quartz grains. Muscovite, graphite, pyrite, and magnetite are the most abundant accessory minerals. Granofels have a granoblastic to nematoblastic texture. Some wollastonite porphyroblasts have sieve texture and contain xenoblastic quartz grains.*
>
> *Quartz is the most abundant mineral in the granofels. Wollastonite, epidote, diopside, orthoclase, and garnet are prominent mineral constituents that locally comprise 10 to 25 percent of the granofels.*

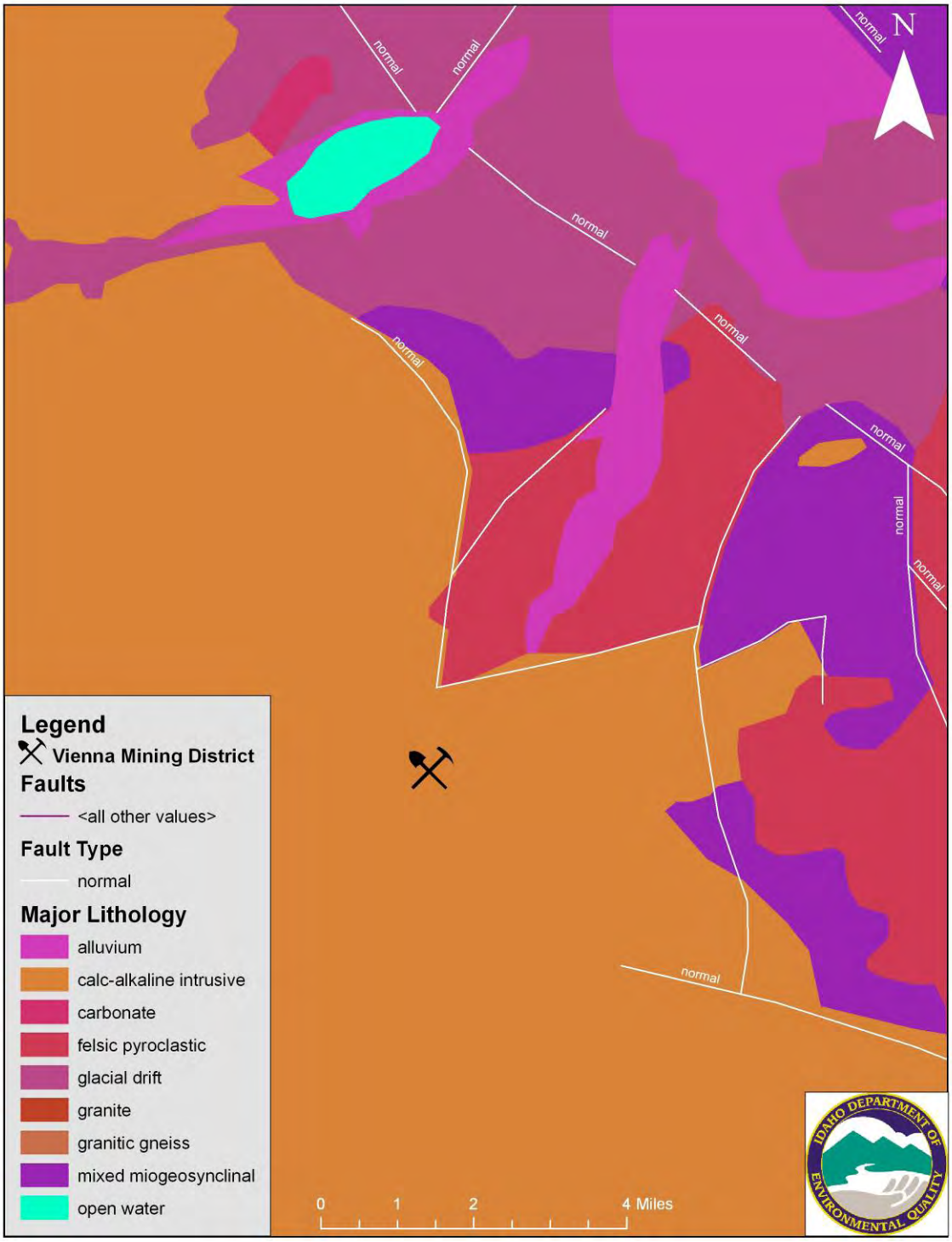

Figure 3. General Geology

Unmetamorphosed lower Wood River strata in the Halley quadrangle were dated as Middle Pennsylvanian (Desmoinesian) by Moore and others (1944, p. 701). Bostwick (1955, p. 944) concluded from paleontological evidence that the upper two-thirds of the Wood River Formation near Bellevue is of Early Permian

(Wolfcampian) age. Ross (1962, p. 56) suggested that the minimum thickness of the Wood River Formation in the adjoining Hailey quadrangle is 8,000 feet.

Biotite quartz monzonite is the dominant rock type in the Vienna district, cropping out in 80 percent of the area. The pluton was intruded into Paleozoic strata during one of the later episodes in the emplacement of the Idaho batholith. A lead-alpha age determination on zircon from a granodiorite east of Stanley gave an absolute age of 94 million years (Jaffe and others, 1959, p. 94). In most places, the eastern edge of the quartz monzonite is in fault contact with metasedimentary rocks of the Wood River Formation and volcanic rocks of Tertiary age.

Fresh specimens of biotite quartz monzonite range in color from very light gray to light olive gray; weathered surfaces range from yellowish gray to moderate brown. Near hydrothermal veins, the rock is altered and is greenish gray. The rocks are cut by one or more sets of closely spaced joints.

The quartz monzonite is medium grained and has hypidiomorphic granular texture. In a few specimens, a moderate cataclastic fabric is superposed.

The biotite quartz monzonite has the following average mode: quartz, 40 percent; plagioclase (An31), 30 percent; potassian feldspar, 20 percent; biotite, 8 percent; and minor amounts of magnetite, ilmenite, sphene, apatite, zircon, and allanite.

The quartz formed late; interstitial, anhedral to round grains of quartz occur singly and in clusters between feldspar crystals. Plagioclase occurs in somewhat altered, euhedral crystals ranging from 0.5 to 2 mm in length.

Microcline is the most abundant potassian feldspar; orthoclase is present in some samples. Both microcline and orthoclase are perthitic in part. Microcline in-set crystals, as much as 15 mm in length, contain unoriented relict crystals of plagioclase and biotite and probably formed as the result of late deuteric reactions.

The biotite is pleochroic in yellow and brown. It forms ragged and broken, un-oriented flakes that average 1 mm in length. Cataclastic microfolds are present in a few flakes. Magnetite is the second most abundant accessory mineral. Some specimens contain as much a 1 percent magnetite. Ilmenite occurs with magnetite and separately. In places, leucoxene forms after ilmenite. Sphene locally makes up as much a 1 percent of the quartz monzonite. Apatite is present as inclusions in magnetite and as discrete crystals. Zircon and allanite form euhedral crystals and inclusions in biotite that are surrounded by pleochroic halos.

Adjacent to hydrothermal veins, the rock is altered and its mafic mineral is lower. Near the cross-cutting veins, some of the mafic constituents seem to have been re-moved from the country rook.

On the divide between Mill Gulch and Vienna Creek, quartz monzonite along fractures has been transformed to quartzite schist by mechanical metamorphic differentiation caused by shearing stress.

Challis Volcanics

Flows, flow breccias, and tuffs of the Latite-andesite Member (Ross, 1937, p. 49) of the Challis Volcanics (Ross, 1930, p. 2) crop out in the northeastern part of the Vienna district. These volcanic rocks range in composition from hornblende latite to biotite-hornblende quartz latite. In the Vienna district, the Challis Volcanics unconformably overlie metasedimentary rocks of the Wood River Formation and quartz monzonite of the Idaho batholith. In one part of the district, volcanic rocks are in fault contact with the quartz monzonite.

Ross (1962, p. 77) estimated that the total thickness of the Challis Volcanics varies from 2,500 feet to more than 5,000 feet. In the Vienna district, the Latite-andesite Member is more 'than 1,200 feet thick.

Fresh samples of Challis Volcanics from the Vienna district are predominantly olive gray, but range from brownish gray to dusky yellow green. The color of weathered specimens is chiefly light olive gray, but may be light brownish gray or dusky yellow green because of propylitizaticin.

The tuff and flow-breccia as well as most of the flows studied are hornblende latite. Two flows are biotite-hornblende quartz latite.

The hornblende latite has the following average mode: potassian feldspar, 40 percent; plagioclase (An36), 40 percent; green hornblende, 10 percent; biotite, 5 percent; quartz, 5 percent; and minor amounts of apatite, zircon, magnetite, and augite.

The hornblende latite flows have a felty, hiatal porphyritic texture. They contain phenocrysts of andesine, sanidine, green hornblende, biotite, and quartz. The holocrystalline to hypohyaline groundmasses are composed of potassian feldspar and plagioclase.

The hornblende latite flow breccias also have hiatal porphyritic textures, but contain angular irregular xenoliths of andesite, latite, and trachyte as much as 35 mm in length. Most of the xenoliths have a more mafic composition than the groundmass of the breccia.

The hornblende latite tuff contains hypohyaline and mafic lithic fragments as well as smaller shards of volcanic glass. Flow and compaction structures are absent. Because sorting is fair to moderately good, the hornblende latite tuff is probably an airfall tuff.

The biotite-hornblende quartz latite has the following average mode: plagioclase 3fi) , 30 percent; potassian feldspar, 30 percent; quartz, 20 percent; brown hornblende, 10 percent; biotite, 10 percent; and minor amounts of magnetite and zircon.

The quartz latite flows contain phenocrysts of andesine, biotite, hornblende, quartz, and magnetite. The rocks have hiatal porphyritic textures and holocrystalline to hypohyaline groundmasses, composed chiefly of potassian feldspar.

Basal clastic beds of the Latite-andesite Member exposed at a uranium prospect near Stanley contain spores and pollen of Eocene age (Ross, 1962, p. 98). In the Mackay quadrangle, granitic rocks that have intruded the lower part of the Challis Volcanics are 40 to 50 million years old, based on lead-alpha age determinations. Similar rocks in the Middle Fork of the Salmon River area are 59 million years old. Ross inferred from these data the ". . volcanism began in the Eocene, conceivably in the Paleocene" (Ross, 1962, p. 101). From this evidence, I conclude that the Latite-andesite Member of the Challis Volcanics was deposited in the Vienna district during Eocene and perhaps, in part, early Oligocene time.

Dikes

A 4-inch thick quartz-microcline pegmatite intrudes quartz monzonite in the upper part of Sawmill Canyon.

Two parallel andesite breccia dikes, 30 and 75 feet thick, which strike 060° and dip 60ºNW were seen near the headwaters of the principal unnamed stream between Sawmill Canyon and Mill Gulch. Plagioclase, amphibole, and pyroxene phenocrysts are set in a felty groundmass of plagioclase and potassian feldspar microlites. Magnetite is a minor accessory mineral as well as an alteration product.

Inclusions of quartz monzonite which are more than 2 feet in diameter may be evidence for forceful injection of the dikes, perhaps by shattering or magmatic stoping. The andesite breccia dikes in the Vienna district probably were intruded at almost the same time that the consanguineous Latite-andesite Member of the Challis Volcanics was extruded.

Most of the dikes in the Vienna district are hornblende latite porphyry; all dikes of this composition intrude quartz monzonite.

The largest hornblende latite porphyry dike is south of the Solace Mine and crops out along the drainage divide between Emma Creek and the western fork of Smiley Creek. The 50-foot thick dike strikes 065° to 075° and dips from 75°SE to vertically. It can be traced continuously along strike for 0.6 mile; discontinuous

exposures of similar rocks can be traced 0.7 mile farther along the same trend to the southwest.

Two parallel hornblende latite porphyry dikes, approximately 800 feet apart, were noted at the foot of the north face of Marshall Peak. These dikes strike 290° and dip vertically. Each has an average thickness of 15 feet.

A hornblende latite dike crops out 800 feet southeast of Johnson Creek along the main unnamed stream that drains the north side of Marshall Peak. The 12-foot dike strikes 050° and dips 750SE.

The dike rocks contain plagioclase (An28) phenocrysts as much as 7 mm in length. Inset crystals of brown hornblende are also common and in places make up 40 percent of the total rock. Some specimens contain a few small phenocrysts of biotite. Zircon and magnetite are less abundant accessory minerals. The groundmass is composed of microlites of potassian feldspar and plagioclase.

Chilled contacts and thin apophyses of very fine-grained minerals are evidence that the dike-forming magma was intruded into cold, completely solidified quartz monzonite. The biotite and potassian feldspar content of the hornblende latite porphyry decreased toward the margins of the dikes. Xenoliths as much as 4 inches in diameter were noted along the margin of the largest dike.

A diabase dike cuts quartz monzonite at the extreme western edge of the Vienna district, near the head of Johnson Creek. The olive-gray dike has a thickness of 2 feet, strikes 335°, and dips 700SW. Labradorite laths partly enclose grains of pigeonite, magnetite, ilmenite (?), and olivine.

Quaternary Sediments

Alluvial clastic sediments are exposed in all principal stream valleys in the Vienna district. Part of the detritus is made up of glacial debris.

Terrace deposits are common in glaciated valleys in the Vienna district. Williams (1961, p. 19) concluded that such deposits are of Pinedale age.

Ridges of moraine bound the valleys of West Beaver Creek and the two major forks of Little Beaver Creek (Williams, 1961, pl. 1). A lateral moraine separates Alturas Lake from West Beaver Creek. Williams (1961, p. 9) concluded that this moraine is of Pinedale age. A belt of hummocky terminal moraines extends from West Beaver Creek to the mouth of Frenchman Creek. Below the mouth of Vienna Creek, Johnson Creek crosses an end moraine.

A narrow, pitted, outwash plain with prominent kettles extends along the south side of the Salmon River valley from the mouth of Smiley Creek to the Alturas Lake moraine. The outwash sediments are also of Pinedale age.

Recent Sediments

Small rock glaciers of post-Pinedale age are present at the heads of north-facing cirques. Alluvial fans containing poorly sorted post-Pinedale (?) sediments are well developed at the termini of lateral tributary streams that enter the main U-shaped valleys. Fine-grained alluvium of post-Pinedale age is present on the floodplains of some streams.

STRUCTURAL GEOLOGY

Vienna Faults

Two steep faults, here named the West Vienna and South Vienna faults, separate the eastern edge of the Idaho batholith from downthrown rocks of the Wood River Formation and Challis Volcanics.

The West Vienna fault between Little Beaver Creek and the county line has an average strike of 0100 and dips approximately 80ºSE. The exposed thickness of the Latite-andesite Member of the Challis Volcanics is 1,200 feet; therefore, the probable minimum vertical displacement along the West Vienna fault is 1,200 feet.

The South Vienna fault between the county line and Smiley Creek has an average strike of 080°. At one point along this segment, the fault strikes 0600 and dips 80° SE. In two places, the trace of the steep reverse fault is offset to the southeast 20 and 100 feet, respectively, along cross faults that strike 340°.

The South Vienna fault segment projected westward coincides with a saddle in the Sawtooth Range and the valley of Vienna Creek. The West Vienna fault segment continued southward follows the upper course of Vienna Creek. On the basis of this topographic evidence and stained reddish brown quartz monzonite near the inflection point of contact, it is concluded that two steep faults intersect near the head of the unnamed east fork of Vienna Creek.

Between Smiley Creek and Frenchman Creek, the contact between the Challis Volcanics and the quartz monzonite strikes 070°. Along tributary F13 of Frenchman Creek (pl. 2), the contact is approximately vertical and is probably a continuation of the South Vienna fault.

Other Faults

From the outcrop pattern, the northeast-trending Smiley Creek lineament may be inferred to represent a left-lateral fault. An alternative interpretation is that the outcrops of the Wood River Formation west of Smiley Creek may be inliers exposed beneath an exhumed unconformity.

Joints

Poles to joints in the Vienna district were plotted on a stereonet. The dominant joint set trends 295° and has northeasterly dips ranging from 20° to 70°. A second strong joint set strikes 040° and dips 80°NW to 80°SE.

Shear zones in the quartz monzonite are essentially parallel to the major joint sets. Ross (1927a, p. 9) noted that such shear zones dip less steeply than the joints. The principal veins follow shear zones.

Intra-formational Contacts

Bedding in the metaquartzites of the Wood River Formation has varied attitudes. A 1r-diagram of poles to the bedding has a diffuse girdle trending 060°; therefore, the folds in the Wood River Formation probably strike approximately 330°. The absence of marker beds in the metaquartzite members precludes detailed structural interpretations. Bedding in the Wood River rocks is largely masked by cataclasis.

In the Vienna district, flows and tuffs of the Challis Volcanics form a homocline that has an average strike of 010° and dips 10° to 18°SE. The Challis rocks and the Vienna fault have nearly parallel strikes, so the flows and tuffs may have been tilted during formation of the Vienna faults.

During the Nevadan orogeny (Anderson, 1948, p. 98). Ross (1936, p. 377-380) concluded that these beds were deformed further into a broad anticline during the intrusion of the batholith; in response to this intrusion, overturned folds and thrust faults formed in the Bayhorse quadrangle northeast of the Vienna district (Ross, 1937, p. 73). However, Anderson (1948, p. 98) attributed the intensive folding and fracturing of the Paleozoic strata to the later transmission of forces through the solid batholith during one or more episodes of the Laramide orogeny.

The stages of Late Cretaceous and Early Tertiary deformation of Paleozoic strata were described by Anderson (1961, p. 64) in the Lemhi quadrangle, approximately 80 miles northeast of the Vienna district.

A later cataclastic deformation is reflected in thin sections of quartz monzonite from the Vienna district. This took place after the consolidation of the Idaho batholith and is assigned a Laramide age.

The age of faults cutting the volcanic rocks of the Vienna district can be stated only as younger than the basal Andesite-latite Member, because the upper members of the Challis Volcanics are absent.

Reid (1963, p. 11) mapped a high-angle normal fault, named the Sawtooth fault by Hamilton (1962, p. 612), paralleling the eastern flank of the Sawtooth Range. The West Vienna fault may be a southward extension of the Sawtooth fault. The high-angle normal Montezuma fault bounds the western flank of the Sawtooth Range (Anderson, 1939, p. 17). The Sawtooth Range therefore appears to be a horst bounded by two steep normal faults. Livingston (1918, p. 491) suggested that the structural basins in south- central Idaho were formed by block faulting of Basin and Range type.

GEOMORPHOLOGY

Pre-Challis Surface

The Challis Volcanics were deposited on a surface of more than 4,500 feet of relief (Ross, 1937, p. 87). In the Vienna district, the elevation of the base of the Challis Volcanics varies from 7,500 feet near Vienna to 8,500 feet in Sawmill Canyon. Post- Challis block faulting may account for some of the difference.

Post-Challis Surface

Ross (Ross and others, 1930, p. 645) noted ". . . remnants of an old peneplain in the post-Challis topography" at an elevation of approximately 9,500 feet. Within the Vienna district, fifteen prominences above 9,500 feet have an aggregate area of approximately 1.5 square miles. Because these lack broad-topped remnants or many accordant summits a major post-Challis erosion surface at 9,500 feet is questionable.

Glaciation

The post-Challis landscape of the Sawtooth Range was modified by alpine glaciation during the Pleistocene Epoch. The paths of the glaciers were controlled by the preglacial drainage systems. During Pinedale time (Williams, 1961, p. 10) the valleys of the principal streams were filled with moving ice.

Cirques formed at the heads of major valleys. The V-shaped transverse profiles of these valleys were altered to U-shaped troughs.

Till and moraines were deposited in the lower parts of the valleys. All major valleys in the Blaine County portion of the Vienna district have U-shaped profiles, but glaciation was less extensive in valleys south of the Sawtooth Range.

Drainage

Only the unglaciated V-shaped valleys contain streams that are graded. The glaciated valleys have irregular longitudinal profiles and contain nongraded streams.

The tributaries of the South Fork of the Boise River have steeper profiles than their Salmon River counterparts. Many tributary streams have a linear drainage pattern that suggests structural control by joint sets.

Section 7. Current and Potential Future Lands Uses

The Vienna Mining District is also located adjacent to the Sawtooth National Recreation Area, which is contained by the Boise, Sawtooth, and Salmon national forests. This includes the Sawtooth Wilderness. It is administered by the Sawtooth National Forest out of Ketchum and Stanley, Idaho. The area covers approximately 778,000 acres.

The Sawtooth National Recreation Area (SNRA) is a National Recreation Area designated for the protection of recreational values, but also provides for extractive industries such as mining, timber, and agriculture.

Primary recreational activities include hunting, fishing, swimming, whitewater and power boating, motorcycle and other off road vehicle (ORV) travel, backpacking, horseback riding, alpine and backcountry skiing. Temporary housing including hotels, cabins, tent camping, yurts, camper/trailer, and a public community water system support recreational users.

Primary extractive industries include hard rock (gold and silver) mining, timber, alfalfa production, and sheep and cattle production. The SNRA contains several historic mining districts.

The area is also used for development of primary and recreational residential developments. The villages of Sawtooth City, Obsidian, and Stanley are the centers of both the recreational and extractive industries in the area.

Photo 11. Centennial Motorcycle Trailheads just below the historic town site of Vienna. (Photo by Schuld 9/14/10)

Traveling up the drainage visitors leave the lower meadows and enter the upper watershed which is dominated by alpine woody and shrub communities. Smiley creek hosts one of the newly developed Centennial motorcycle trailheads just below the historic town site of Vienna.

Photo 12. The historic town site of Vienna is a popular place for camping and accessing the Centennial Trail. It is just down hill from the Wisconsin Mill Site. (Photo by Schuld 9/14/10)

At the time of DEQ's visit, the dispersed camp sites at the old Vienna town site were occupied by numerous parties, presumably forest service workers and hunters scouting for "bow" hunting season.

The Smiley Creek area is very popular with both resource extractive and recreational users. The resources supporting both of these interests are very well maintained, and it is presumed these uses will persist in perpetuity. The development of primary and recreational residences and commercial business is likely to continue well into the future requiring a greater demand on local infrastructure particularly drinking water systems and both solid and human waste disposal.

Section 8. Mine and Mill Site Conditions

Section 8 captures observations made by DEQ during the field examinations on eight major mine or mill facilities and another 10 minor mine sites and claims that have seen very little disturbance. Some of the observations have been put into proper context by desktop research based on histories and geologies of the sites, discussions with site owners and locals, and some of the analytical work completed on soils, sediments, and water.

8.1 Wisconsin Mill Site (aka Rhine Lode and Mill Sites)

The Wisconsin Mill Site, which is overlain by the Rhine Lode and Mill Site claims, contains the remnants of mill foundations, refractory brick, and an old boiler used as foundation for a loading ramp, and less than 100 cubic yards of mine or mill wastes. Although the morphology of the site suggests the vast majority of mine and mill wastes previously stockpiled at the site have been removed, alteration minerals, refractory materials, erosional features, and a direct connection between the site and delivery to Smiley Creek led DEQ to collect waste samples at the site.

Photo 13. Wisconsin Mill Site lower foundations and loading ramp (soil sample WMSSS1). (Photo by Schuld 9/14/10)

A soil sample (WMSSS1) was collected of the mine wastes that were residual around the makeshift Wisconsin Mill Site loading ramp. There was less than 100 cubic yards consisting of a heterogeneous mix of less than 24-inch rock. An approximate two pound sample was collected from less than 2-inch material and screened through a 9 mesh sieve. Approximately half of the sample passed through the 9 mesh sieve and a fraction of that was less than 10% organic (mostly pine needles). The wastes had no visible sign of sulfides, but there was a considerable amount of oxidized material resembling some of the local ores.

The amount of brick at the site did not look like refractory brick until it was observed that many "fines" located with the brick appeared to be oxidized ore. Although this is only a guess, DEQ thought perhaps some attempt was made to roast sulfide ores prior to running them through a concentrator.

Photo 14. Above the lower foundations of the Wisconsin Mill Site is a large amount of refractory brick which may have been used to roast crushed sulfide ores prior to gravity separation (soil sample WMSSS2).
(Photo by Schuld 9/14/10)

A waste sample (WMSSS2) was collected in the fines surrounding the bricks on the middle level of the mill site (Lat. 43.71667ºN, Long. 114.83260ºW).

Photo 15. Surface runoff from the USDA-Forest Service (USFS) public roadway is down cutting deep gullies at the base of the Wisconsin Mill Site.
(Photo by Schuld 9/14/10)

Although the interior of the mill site exhibits minor erosional features, the portion of the site adjacent to Smiley Creek Road is severely eroded. This results in fines and other residual wastes being delivered to Smiley Creek near the "old" trailhead for the Centennial Motorcycle Trail. There is one principal reason and several contributing factors to this problem. The culvert between the Wisconsin Mill Site claim and the Rhine Lode claim (Lat. 43.81597°N, Long. 114.83305ºW) and another culvert approximately 300 feet south (Lat. 43.81543ºN, Long. 114.83468ºW) need replacing. Lacking these culverts, the flow path and velocities for surface water on the road during spring runoff will continue to degrade the road and mill site. Lacking the first culvert, all of the precipitation in the sub-watershed behind the mill site is channeled to and then down the road and through the mill site. These culverts must be replaced or the State's Water Quality Standards are most likely being violated during spring runoff.

Photo 16. Surface runoff from the USFS public roadway is down cutting deep gullies at the base of the Wisconsin Mill Site and delivering it to Smiley Creek near the "old" trail head for the Centennial Motorcycle Trail.
(Photo by Schuld 9/14/10)

Photo 17. Surface runoff from the Wisconsin Mill Site enters Smiley Creek (surface water sample WMPPESW1). (Photo by Schuld 9/14/10)

Photo 18. Wisconsin Mill Site/Smiley Creek Probable Point of Entry (PPE). Sample WMPPESW1 collected at Lat. 43.81758ºN, Long. 114.82915º W. (Photo by Schuld 9/14/10)

Sediment sample WMPPESD1 was collected in a deposition area below the PPE on Smiley Creek. The sediment was very sandy (grus-like), dominated by granodiorite gravels (<50%), and very few organics. About 10 pounds of sample was collected and sieved in order to produce approximately 500 mg of sample.

Photo 19. Replacement of the culvert at this location on the roadway (above the Wisconsin Mill Site) would likely divert surface runoff from the erosional situation found at the mill site. (Photo by Schuld 9/15/10)

Although the location for the recommended culvert is on the roadway at the property boundary between USFS administered lands and the Wisconsin Mill Site, it was suggested that the private property owner owns the road. A culvert had apparently been located here but it was torn out, and now lays in a crumpled heap adjacent to the road.

Photo 20. A second culvert installed approximately 300 feet further up the road on the Rhine Lode claim would effectively reduce surface runoff velocities, and decrease the challenges of operation and maintenance on the first culvert. (Photo Schuld 9/15/10)

Recommendations to the private land owner and the USFS, however they resolve responsibility, is to replace or install appropriate drop boxes and culverts, or other diversions, above the Wisconsin Mill Site

8.2 Webfoot Mine and Mill Site (aka Mountain King)

The Webfoot Mine is located on several patented mining claims including the California, Flagstaff, Rebellion, and Webfoot. In spite of the namesake for the Vienna Mining District and historic town site, the Webfoot has the most significant volumes of residual waste and surficial evidence of development in the upper Smiley Creek drainage.

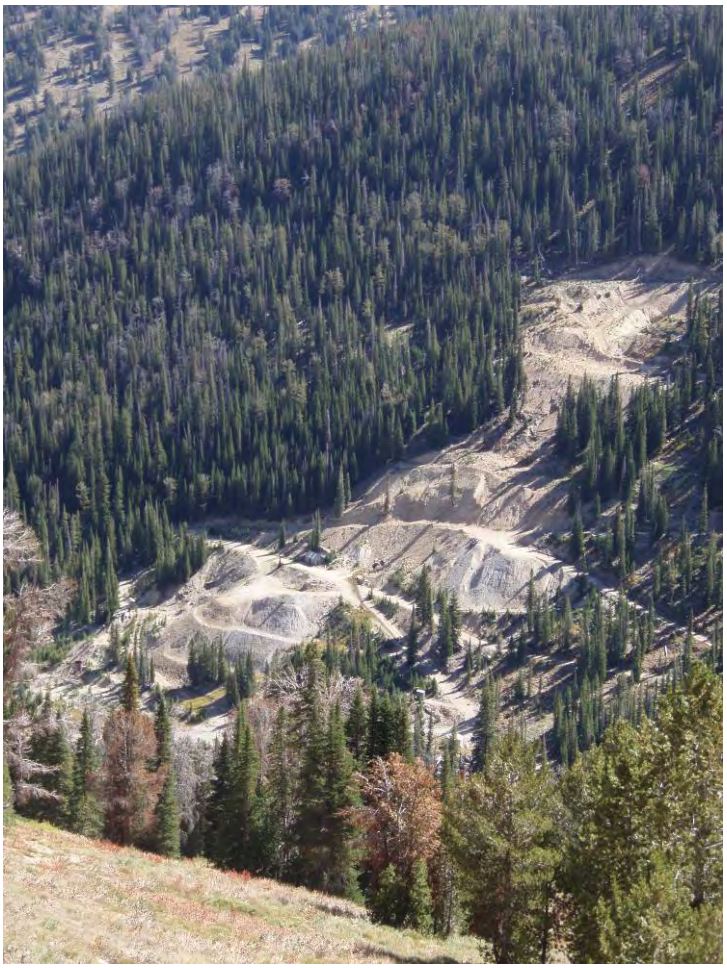

Photo 21. The Webfoot Mine and Mill Site has at least five main levels of mine workings and a mill facility that processed at least 2600 tons of ore. (Photo by Schuld 9/15/10)

Photo 22. At the very top of the Webfoot workings is a bench that has apparently been developed for a diamond drill hole site. (Photo by Schuld 9/16/10)

Diamond drill hole WFDDH1 on the upper Webfoot bench at Lat. 43.80501ºN, Long. 114.84241ºW has been located and mapped for references sake.

Photo 23. Adjacent to the upper Webfoot Mine bench is a recent wooden foundation that was perhaps used as a core shed or center of exploration activities. (Photo by Schuld 9/16/10)

Photo 24. Beneath the Upper Webfoot bench is the uppermost underground developments or 200' Level Adit and Waste Dump. (Photo by Schuld 9/16/10)

This area around the upper Webfoot Mine, henceforth 200' Level Adit, looks more like an open pit than an underground working since it was blasted away during the filming of the hydraulic mining sequence in Clint Eastwood's and Warner Brothers' Productions 1985 movie "Pale Rider." The site was leased to Warner Brothers Production by a mine investment conglomerate called NAFCO that owned the property during the 1980's and early 1990's. No information has been researched regarding this lease or the previous owner.

The 200' Level Adit contains evidence of intermittent drainage, presumably during the spring when ground water levels are highest and snow drifts accumulated in the collapsed adit area melt. This evidence includes ferrous and/or arsenic staining and a lush community of sedges along the old rail bed.

The 200' Level Waste Dump contained more than 1,000 cubic yards of the waste containing massive sulfides, oxides and indications that mine drainage occurs, at least intermittently. Soil sample UWFWD1SS1 was collected at Lat. 43.20599ºN,
Long. 114.84289ºW.

During sample collection it was observed that wooden piles (posts) were either driven into the waste dump or were there prior to its construction. These piles may be framed together to lend some internal structural support to the waste dump similar to what old trestles do inside of waste dumps.

Photo 25. Looking down into the exposed 200' Level Adit. Vegetation (sedges) and some iron staining down the length of the gully indicates seasonal discharge from the workings. (Photo by Schuld 9/16/10)

Photo 26. Looking into the caved 200' Level Adit. (Photo by Schuld 9/16/10)

Photo 27. Iron staining down the length of the 200' Level Adit. (Photo by Schuld 9/16/10)

Photo 28. The 200' Level Waste Dump appears to be modified by reclamation work. (Photo by Schuld 9/16/10)

Supposedly, mitigation work was completed at the Webfoot Mine following the shooting of the movie "Pale Rider". However, there is very little organic matter in the surface material and this presumably limits the recovery of vegetation and stability of the dump.

Photo 29. Although they are not very evident in this photo, looking down this slope pilings, were noted in the face of the waste dump, presumably to provide some internal stability. (Photo by Schuld 9/16/10)

Photo 30. At approximately 100 feet in elevation below the 200' Level Adit is the buried 300' Level Adit. (Photo by Schuld 9/16/10)

At the 300' Level Adit there is very little evidence regarding where a tunnel was driven at this level. However, staining from drainage and the small community of sedges at the toe of the 200' Level Waste Dump may indicate the tunnel was driven here.

Photo 31. This is the toe of the 200' Level Waste Dump at the 300' Level Landing and Adit. (Photo by Schuld 9/16/10)

The Webfoot 300' Level Adit and Waste Dump are located at Lat. 43.80631ºN, Long. 114.84325ºW. As mentioned, the adit is buried and/or collapsed, and there is vegetation growing in the seep area which is proximate to where the adit should be. Similar to the 200' Level Waste Dump, waste volumes (1,000 to 2,000 cubic yards) and indications of intermittent mine drainage led to the decision to collect soil sample WF300LVLAD. Inspection of the area leads to the conclusion that erosion is problematic, but there is no evidence at this level that delivery occurs to surface waters or wetlands.

Unlike the 200' Level Waste Dump, the face of the 300' Level Waste Dump appears to be slightly more stable and conducive to the re-establishment of floral communities, particularly trees.

Photo 32. Trees growing on the Webfoot 300' Level Waste Dump. (Photo by Schuld 9/16/10)

Photo 33. Looking down on the Webfoot 300' Level bench. (Photo by Schuld 9/16/10)

Photo 34. Looking up the Webfoot 200' Level Waste Dump, it is pretty obvious the dump face continues to erode. (Photo by Schuld 9/16/10)

Photo 35. Soil sample WF300'WDSS1. (Photo by Schuld 9/16/10)

Photo 36. Looking down on the Webfoot 400' Level Adit, Waste Dump, and mill foundations. (Photo by Schuld 9/16/10)

Photo 37. Webfoot 400' Level Adit is open and has discharge draining from it (sample WF400LVSW1), Lat. 43.80683ºN, Long. 114.84358ºW. (Photo by Schuld 9/16/10)

Photo 38. Webfoot 400' Level Adit. (Photo by Schuld 9/16/10)

Photo 39. Compressor shed at Webfoot 400' Level Adit.
(Photo by Schuld 9/16/10)

Although very little RCRA regulated hazardous wastes or deleterious materials was found throughout the Vienna District, there are some residual solid and petrochemical wastes. They do not pose a substantial risk to water quality, but those wastes and containers in the 400' Level Adit compressor shed should be properly disposed of by the lessee or owner of the Webfoot Mine.

Photo 40. Concrete foundation adjacent to the Webfoot 400' Level Adit.
(Photo by Schuld 9/16/10)

The Webfoot 400' Level consists of an adit (and related underground workings), a large waste dump, and the upper foundations of the Mountain King Mill. The adit is discharging approximately 20+ gpm. This water is diverted (somewhat) around the western edge of the

waste dump. Water quality sample WF400LVSW1 was collected at Lat. 43.80683ºN, Long. 114.84358ºW.

Because of the drainage, presence of sulfide bearing wastes and the size of the Webfoot 400' Level Waste Dump soil sample WF400LVSS1 was collected at Lat. 43.80709ºN, Long. 114.84386º W.

Between the Webfoot Mine Levels 400', 500', and 600' there are remnants of mill foundations from which approximately 2600 tons of ore were run through a "chlorination" mill system, presumably the Mountain King Mill. Although there is evidence of several hundred tons of mine waste left, very few tailings are present left. Most of the concentrates have been shipped off site and tailings have likely been buried under mine wastes or washed down Smiley Creek. The current lessee/partner of Terrawiggly has indicated an interest in reopening the Webfoot 400' Level and reconnection of the 600' Level via raises for ventilation and escape. If the rehabilitation is successful, it is likely most of the 400' Level water may report these tailings. However this is speculation.

Photo 41. Mill foundations (Crusher?) on 400' Level Waste Dump. (Photo by Schuld 9/16/10)

Photo 42. Mine drainage from Webfoot 400' Level Adit. (Photo by Schuld 9/16/10)

Photo 43. The Webfoot 400' Level Waste Dump was sampled (sample WF400LVWDSS1). (Photo by Schuld 9/16/10)

Photo 44. The area between the Webfoot 400' and 500' Levels is dissected by a series of benches which were presumably constructed to provide for construction and operations of the mill. (Photo by Schuld 9/16/10)

Photo 45. Road out to the lower mill site and Webfoot 500' Level Adit. (Photo by Schuld 9/16/10)

Photo 46. Although the details are rather obscured, this appears to be the location of an adit, presumed to be a 500' Level Adit. (Photo by Schuld 9/16/10)

Photo 47. This pile of timbers, just outside of the 500' Level Adit appear to have been part of the main Mountain King Mill building because of the remnants of tanks and plumbing material in the pile. (Photo by Schuld 9/16/10)

Photo 48. Processing tank for Mountain King Mill.
(Photo by Schuld 9/16/10)

Photo 49. Processing tank for Mountain King Mill.
(Photo by Schuld 9/16/10)

Photo 50. Unidentified mill waste found at base of process tank.
(Photo by Schuld 9/16/10)

Photo 51. Lower benches at Mountain King Mill Site.
(Photo by Schuld 9/16/10)

Photo 52. Adit water crossing the lower benches at Mountain King Mill Site. (Photo by Schuld 9/16/10)

The water course has been tracked from the Webfoot 400' Level Adit across the 400' and 500' Level waste dumps to Smiley Creek. Because the waste dumps represent additional sources for contamination, wastes and water at the toe of the dump was sampled on September 13, 2010 during a tour of the property with the owners (samples WFWD2SS1 and WFWD2SW1). It should be noted that until the Webfoot was surveyed in greater detail, the sample designation was for a Waste Dump #2 (WD2) instead of the more proper designation 500' Level Waste Dump (500LV) as used with other samples collected on September 16, 2010.

As will be discussed, DEQ located and sampled one PPE for the Webfoot Mine and Mill Site. Although there are perhaps two distinctive entry points for the water from the 400'/500' Level adits/waste dumps and the 600' Level Adit and Waste Dump, they are in such close proximity (less than 100 feet) it is unlikely a clear distinction could be made between water and sediment samples. Therefore, one PPE was sampled (samples WMSPPESD1 and WMSPPESW1).

Photo 53. A tailings impoundment below Webfoot 500' Level Waste Dump and Mill Site may be effective at times as a sediment pond, but the drainage to Smiley Creek has since been short circuited around this sump (sample WFMSSS1). (Photo by Schuld 9/14/10)

Beneath the 500' Level Waste Dump is a small sump or sediment pond. The fines in the bottom of the pond resembled those tailings found adjacent to Smiley Creek. Because of the resemblance and the property owner's interest in incorporating this old sump in a modernized water management system for the site, DEQ collected soil sample WFMSSS1 of the fines at Lat. 43.80814º N, Long.114.84416ºW. During the sampling, a discharge pipe that appeared in alignment with the historic processing tank (Photos #48 and #49), leading DEQ to believe this was the primary discharge route from the mill to tailings impoundments adjacent to Smiley Creek. There are less than 20 cubic yards of tailings (?) in this sediment basin.

Photo 54. Approximately 200 feet west of the 600' Level Waste Dump is a gully that constantly carries drainage from the 400' Level Waste Dump to Smiley Creek. (Photo by Schuld 9/14/10).

Photo 55. Approximately 200 feet west of the 600' Level Waste Dump is a gully that constantly carries drainage from the 400' Level Waste Dump to Smiley Creek. Coincidentally, this photo shows a small stand of trees surrounding several patented claim corners for the California, Flagstaff, and Alturas lodes. (Photo by Schuld 9/14/10)

Photo 56. Old ore chute on west side of Webfoot 600' Level Waste Dump. (Photo by Schuld 9/14/10)

Photo 57. Webfoot 600' Level Adit. (Photo by Schuld 9/16/10)

The Webfoot 600' Level Adit and Waste Dump facilities are being redeveloped for new underground production. Underground workings are being rehabilitated, and there is an intention to reconnect the 600' and 400' levels for safety and other operational purposes. A new muck pile has been developed adjacent to the adit while the "old" waste dump is being excavated and redeveloped for more appropriate storage of wastes and loading of ores for shipment. The 600' Level Adit discharge at the time of DEQ's visit is approximately 20 gpm. The effluent was sampled (sample WF600LVSW1) at Lat. 43.80853º N, Long. 114.84258ºW.

Regarding the drainage, DEQ has recommended some thought be given to creating a French drain and infiltration gallery parallel to the access road to discharge mine water. The waste rock

dump can then be extended eastward over the french drain allowing mine waters to infiltrate the gallery without contacting mine waste rock.

Photo 58. Muck pile adjacent to Webfoot 600' Level Adit.
(Photo by Schuld 9/16/10)

Photo 59. Covered trestle over Webfoot 600' Level Waste Dump.
(Photo by Schuld 9/16/10)

Photo 60. The Webfoot 600' Level Waste Dump location (sample WF600LVWDSS1). (Photo by Schuld 9/16/10)

Photo 61. Looking down on the west end of the Webfoot 600'Level Waste Dump with mill tailings at the toe near the PPE. (Photo by Schuld 9/16/10)

Photo 62. Covered Webfoot 600' Level trestle and waste dump. (Photo by Schuld 9/16/10)

Photo 63. The Lower Webfoot Mine and Mill Site has both mine wastes and tailings eroding into and possibly leaching into Smiley Creek below the site. (Photo by Schuld 9/14/10)

Photo 64. Tina Elayer collecting field parameters at the Webfoot Mine at Lat. 43.81202 ºN, Long. 114.83791ºW. (photo by Schuld 9/14/10)

The PPE for the Webfoot Mine was determined by DEQ to be approximately 100 feet downstream of where the 600' Level Waste Dump and Mill tailings are adjacent to Smiley Creek. It was assumed this location would provide composite sediment and water quality samples for the 400'/500' Level adits and waste dumps, Mountain King Mill tailings, and 600' Level Adit and Waste Dump. Samples WMSPPESD1 and WMSPPESW1 were collected at Lat. 43.81202 ºN, Long. 114.83791ºW.

Photo 65. Webfoot 600' Level Mine Waste Dump and PPE on Smiley Creek. (Photo by Schuld 9/14/10)

Approximately 2600 tons of ore were supposedly milled at the Webfoot (IGS 1971), but less than 500 tons were found remaining at the site beneath the Lower Webfoot (600' Level) waste dump. Sample WFWD1MT1 was collected at Lat. 43.80948ºN, Long. 114.84312ºW. The mill tailings were <100 mesh but would not pass through 9 mesh sieve because of moisture content. Sample WFWD1MT1 is a composite sample taken at 20 locations around the first tailings pile.

There are several alternatives the owners may consider for management of the tailings. The first alternative would be to remove the tailings and encapsulate them in a higher and drier location. The second alternative would be to stabilize the tailings in place by anchoring filter fabric around the perimeter and top of the pile and then covering with coarse clean angular waste rock. This waste rock should be tested to ensure "non-metaliferous" materials are used. The first alternative is probably more expensive, but has a higher potential of achieving stability. The second alternative leaves the waste in proximity to Smiley Creek which could undercut and destabilize the pile at some future time.

Photo 66. Mountain King Mill tailings were found in two distinct piles below the Webfoot 600' Level Waste Dump. (Photo by Schuld 9/14/10)

Photo 67. Looking up the Webfoot 600' Level Waste Dump from the mill tailings pile. (Photo by Schuld 9/14/10)

Photo 68. Near the Webfoot and the site for the hydraulic mining sequence in the Clint Eastwood movie "Pale Rider," the Jones family has erected a yurt for use during backcountry ski season. (Photo by Schuld 9/14/10)

Photo 69. The Jones family hopes to use Smiley Creek above their yurt as a potable domestic water supply. Above Tina Elayer is collecting field parameters for sample SMCSW3 at Lat 43.80636ºN, Long. 114.84557ºW. (Photo by Schuld 9/14/10)

8.3 Numa Tunnel

The tunnel DEQ refers to as the "Numa Tunnel" may actually be on the Vienna East Extension patented claim, but the internal surveys and corners for the patented claims are poorly defined in this area. For the sake of this analysis the tunnel and waste dump will continue to be referred to as the Numa Tunnel. Similarly Ross (1927) describes the Numa as one of the "Lower Solace" Tunnels.

The adit for the Numa Tunnel is located a short distance (approximately 100 feet) north from perennial flows of upper Smiley Creek on the main road to the Vienna and Solace mines. It is also located about 1,000 feet above the Jones' Yurt.

There are no production records or historical references to the tunnel and, although the adit has caved shut, it is obvious from the waste dump, which contains approximately 1,000 cubic yards of mostly granodiorite, the workings were significant. This volume equates to approximately 300 feet of six feet by eight of tunneling, which is presumed to have unsuccessfully targeted the Vienna ore bodies.

Photo 70. Confluence of Smiley Creek and drainage from the Numa (possible Vienna East Ext.) Tunnel. Water sample SMCSW4 was collected at Lat. 43.80228ºN, Long. 114.84666ºW. (Photo by Schuld 9/14/10)

The Numa Tunnel was found at a collapsed structure at Lat. 43.80228ºN, Long. 114.84666ºW. Its waste dump contains approximately 1,000 cubic yards. Drainage from the collapsed adit is less than 20 gallons per minute (sample NTADSW1). The waste rock found on the dump appears to be only slightly altered granodiorite with very little evidence of sulfide or oxide minerals. The waste rock was not sampled.

Photo 71. The Numa Tunnel's adit is a collapsed feature along the main road to the Vienna and Solace mines. (Photo by Schuld 9/14/10)

Although it appears that the largest portion of adit discharge was diverted towards a confluence with Smiley Creek (approximately 100' down the main road), a seep was also found emanating

from the toe of the Numa Waste Dump. This seep provided the reason to pull a water quality sample NTWDSW1 at Lat 47.79975ºN, Long 114.84652ºW.

Photo 72. Numa Waste Dump. (Photo by Schuld 9/14/10)

Photo 73. Most of the drainage from the Numa Adit flows towards the confluence with Smiley Creek as discussed previously, but some seeps through the waste dump and was sampled at Lat. 47.79975ºN, Long. 114.84652ºW (Sample NTWDSW1). (Photo by Schuld 9/14/10)

8.4 Vienna Mine (aka Vienna Group)

Like the Solace, Emma, and Webfoot Mines, the Vienna Mine (see Figure 4) was one of the premier producers in upper Smiley Creek having produced and shipped well over 1,000 tons of high grade ore to mills and smelters. At one time the mine employed over 120 miners (Burchard, 1885, pp263). The Vienna Mine was once part of a large group of 33 patented claims known as the "Vienna Group."

Contrary to where the USGS topographic maps have the Vienna Mine located, it is located at approximately Lat. 43.80452ºN, Long. 114.85287ºW. This is on the opposite (west) side of the upper basin facing the Webfoot Mine. It should also be noted that the USFS is completing a new survey of the Vienna District, and their working map shows the Vienna East Extension Claim as the Virginia East Extension. Unless the BLM GLO plats are incorrect, this should be the Vienna East Extension.

Numerous inspection reports of the Vienna Mine indicate the Vienna had at least six tunnels. DEQ mapped eight of them, an open raise from the lowest level, and a length of cat cuts used to explore the surface expressions of numerous veins along the ridgeline. Lacking clear designation of these adits or levels, DEQ has arbitrarily designated them Adits #1 though #8 based on how they were encountered during field mapping.

It should also be noted about the Vienna Mine that there were no indications anywhere on the site of water discharging from workings or waste dumps, nor any direct connection to surface or ground waters. There are numerous indications of localized leaching of minerals near the waste dumps, but it did not appear to have migrated far which may be the result of the buffering capacity of the local petrology.

Although the lower waste dump, Vienna Waste Dump #1, had been altered by bulldozing, it did not appear to contain more than 500 cubic yards of waste. Nor were sulfides or oxides a large portion of this waste. Therefore, DEQ did not sample Vienna Waste Dump #1.

Vienna Adit #1 is an open adit with no visible signs of drainage. Although access to the property is restricted this is a dangerous physical hazard. The adit is located at Lat. 43.80403ºN, Long. 114.85198ºW.

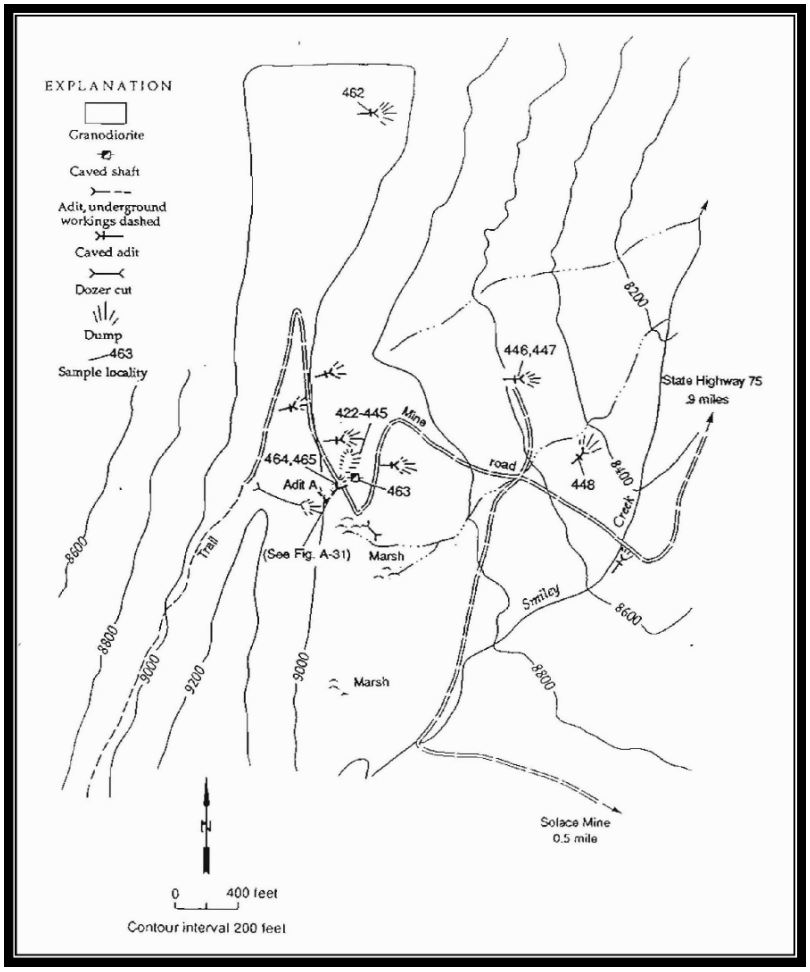

Figure 4. Excerpted from Victoria E. Mitchell's *"History of Mines in the Smiley Creek Area of the Vienna Mining District, Blaine and Camas Counties, Idaho"* **(Idaho Geological Mitchell IGS 2009) after Federspiel (et al, 1992).**

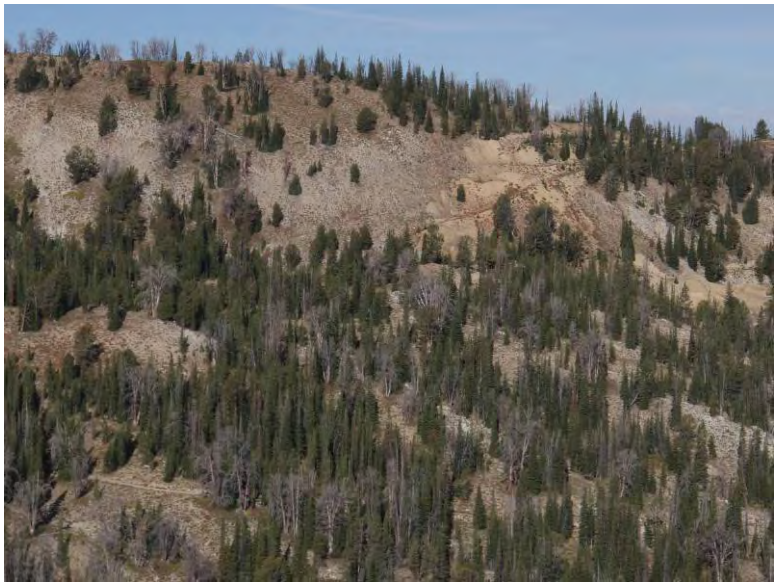

Photo 74. Vienna Mine as viewed from the upper Webfoot Mine. (Photo by Schuld 9/15/10)

Photo 75. Vienna Mine as viewed from the upper Emma Mine. (Photo by Schuld 9/13/10)

Photo 76. The Vienna Mine is located on a series of benches in the upper glacial cirque. Undeveloped ground is characterized by large open meadows and seasonally wet bogs or wetlands. (Photo by Schuld 9/13/10)

Photo 77. The lowest waste dump, Vienna Waste Dump #1, has been dramatically altered by dozer exploration and probably sampling. (Photo by Schuld 9/13/10)

Photo 78. Looking across the Vienna Waste Dump #1 from Vienna Adit #1. (Photo by Schuld 9/15/10)

Photo 79. Vienna Adit #1. Open adit. No sign of water coming from adit. No apparent connection to a surface water pathway. Lat. 43.79401ºN, Long. 114.84397ºW. (Photo by Elayer 9/15/10)

Photo 80. Looking up at the Vienna Waste Dump #2 and Adit #2 from the Vienna Waste Dump #1. (Photo by Schuld 9/15/10)

Photo 81. Looking down on one of the lobes of Vienna Waste Dump #2 from the collapsed Vienna Adit #2. The dump was sampled (Sample VWD2SS1). (Photo by Schuld 9/15/10)

Waste Dump #2, located at Lat. 43.80452ºN, Long. 114.85287ºW, has two separate lobes each of which exceeds 1,000 cubic yards of wastes. The waste dump(s) which are dominated by highly altered granodiorite, quartz stock work vein material, chlorite, and both sulfides and oxides was sampled. Sample VWD2SS1 is a composite of 60 samples, each approximately four cubic inches, of wastes collected approximately every 10 feet around the base of the two lobes of the waste dump. The sample was screened through a 9 mesh sieve, bagged, and tumbled to blend the various portions making up the composite.

Photo 82. The second lobe of Vienna Waste Dump #2 is just slightly north of the first lobe. (Photo by Schuld 9/15/10)

Photo 83. Caved Vienna Adit #2. (Photo by Schuld 9/15/10)

There are no signs of discharge from the caved Vienna Adit #2.

Photo 84. Caved Vienna Adit #3 is located at Lat. 43.80547ºN, Long. 114.85312ºW. (Photo by Elayer 9/15/10)

There is no apparent discharges of water from Vienna Adit #3 and no apparent connection of the waste dump to surface waters. Vienna Waste Dump #3 contains less than 1,000 cubic yards and is located at Lat. 43.80542ºN, Long. 114.85294ºW. The waste rock is dominated by altered granodiorite and vein materials. The dump was not sampled.

Photo 85. Vienna Waste Dump #3 above Vienna Waste Dump #2. (Photo by Schuld 9/15/10)

Photo 86. Caved Vienna Adit #4 and waste dump.
(Photo by Schuld 9/15/10)

Photo 87. Vienna Waste Dump #4.
(Photo by Schuld 9/15/10)

Vienna Waste Dump #4, located at Lat. 43.80203ºN, Long. 114.85388ºW, is not much more than a “dog hole” with less than 100 cubic yards of slightly altered granodiorite and very few sulfides present in the waste rock.

Photo 88. Cat cut above the Vienna Mine along the ridgeline. (Photo by Schuld 9/15/10)

On the ridge line above the Vienna and Nellie extension, a very long cat cut was excavated by bulldozer. The cat cut is marked in the distance on the Nellie extension Claim by the separation of the tree lines which looks similar to that seen along power line trails.

Photo 89. The cat cutting above the Vienna workings has exposed a rather dramatic view of the Vienna Vein. (Photo by Schuld 9/15/10)

The Vienna Vein outcrop exposed by the cat cut is located at Lat. 43.80499ºN, Long.114.85445ºW. The outcrop contains large altered fragments of granodiorite, quartz stringers, and massive sulfides. A portion of this area that may have been used as a drilling station has been regraded and seeded. In a conversation with Allen Jones, Allen said the man who did a lot of the cat work was a local resident by the name of Earl Waite.

Vienna Adit #5 located at Lat. 43.80161ºN, Long. 114.85430ºW is not much more than a “dog hole” with less than 50 cubic yards of wastes on the dump.

Photo 90. The cat cutting on the Vienna Vein has completely buried the uppermost Vienna Adit #5. The waste dump, upon which the photographer is standing, is still visible. (Photo by Schuld 9/15/10)

Photo 91. Looking down past the buried Vienna Adit #6 to the Vienna Adit #7. Both of these adits are collapsed. Also notable is Waste Dump #6 and Waste Dump #7. (Photo by Schuld 9/15/10)

Vienna Adit #6 located at Lat. 43.80408ºN, Long. 114.85354ºW is not much more than a “dog hole” with less than 100 cubic yards of wastes on the dump.

Vienna Adit #7 located at Lat. 43.80377ºN, Long. 114.85316ºW is not much more than a “dog hole” with less than 100 cubic yards of wastes on the dump.

Vienna Adit #8 located at Lat. 43.80381ºN, Long. 114.85294ºW is not much more than a “dog hole” with less than 20 cubic yards of wastes on the dump.

Photo 92. Adjacent to the toe of Vienna Waste Dump #8 is an open raise presumably driven up from Vienna Adit #1. The opening is partially blocked but could be a significant physical hazard. (Photo by Schuld 9/15/10)

The caved raise, presumably connecting the Vienna Adit #1 level to the surface, is located at Lat. 43.80372ºN, Long. 114.85262ºW, adjacent to Waste Dump #8 and is a very short distance south of Adit/Waste Dump #2. The opening to the raise is a dangerous physical hazard, and even though access to the property is restricted, it may be appropriate to backfill this opening to eliminate the hazard.

8.5 Solace Mine and Hope Waste Dumps (aka Solace Group)

One of the more important developments in the Vienna District occurred at the Solace Mine. The workings are primarily located on two patented claims, the Solace and the Hope. Previously the Solace Mine was part of the larger “Solace Group” (16 patented claims) which contained three lower tunnels DEQ refers to as the “Numa” “Rebellion” and “Coleman” tunnels named after the claims on which they are located. These lower tunnels were probably driven to assist with drainage of the lower production levels and prospect new ground (Ross 1927).

Currently there is slight misunderstanding about the relationship between the Solace and Hope claims regarding the mine location. Although the internal survey of the claim boundaries was not apparent during DEQ’s visit, it appears from the available claim maps and an old plat the Solace claim was collared on the south side of the Hope claim and the tunnel was driven westward onto the Solace claim. The waste rock and ore from the mine has been stockpiled on the Hope claim where most of it remains.

The Solace Mine (proper) is at least 1,000 feet of workings including a 35º winze, one production stope, and four lower levels (Ross 1926 and Shannon IGS 1971). Approximately 2,000 tons of ore, whose quality is unknown, appears to remain at the site and stockpiled as though it was ready to ship for processing.

Photo 93. The main road through the Vienna Mine travels south to where the Solace, Emma, and Hidden Treasure Mines are located. Above is the first glimpse one gets of the remaining ore piles on the Hope claim at the Solace Mine. (Photo by Schuld 9/14/10)

Photo 94. Looking down on the ore stockpile on the Hope claim from the Solace adit. (Photo by Schuld 9/13/10)

There does not appear to be any seasonal discharge of water from the Solace adit or waste dump. There is no evidence of a direct connection between the workings, waste dump, and nearby surface waters or wetlands.

Photo 95. Solace Mine waste rock. (Photo by Schuld 9/14/10)

The stockpiled ore contains in excess of 2,000 cubic yards of highly altered granodiorite, stockwork, drusy quartz, and vein material with massive sulfides presumably containing argentite, tetrahedrite, prousite, sphalerite, and galena. Although localized staining indicates that some acid generation is occurring, it also appears, from the colors, localized buffering contains any migration of heavy metals from the stockpile or workings.

Although there does not appear to be any connection between the Solace adit and waste dump with surface waters or wetlands, a composite sample (SMWD1SS1) was collected to complete an analysis of any potential risks.

Photo 96. Open Solace adit. (Photo by Schuld 9/13/10)

The Solace Mine has one remaining mine opening which is open and presents a serious physical hazard. As with most such openings, DEQ recommends access continues to be restricted to the property. The opening itself should either be gated or buried.

8.6 Emma Mine (aka Emma and Friend Patented Claims)

The Emma Mine, which is located primarily on the patented claims Emma and Friend, was developed on the earliest discovery in upper Smiley Creek (Smiley Canyon). The mine was located by the area's namesake Levi Smiley in 1878 (Shannon IGS 1971). By the early 1880s at least three mine openings, an adit, and two inclined shafts had been developed. At this time there are at least six caved openings, including the original three, and a massive disturbance of mine waste dumps on the east side of the ridgeline, presumably to sample the historic waste dumps. Three of the caved adits were driven on the south side of the ridge and the Emma claim, presumably in an attempt to intersect veins from the south.

Of the six Emma adits and waste dumps assessed, DEQ did not observe any indications of mine drainage or possible connection to surface waters or wetlands. However, the one "unnamed" adit and waste dump on the west end of the Friend claim did have standing water outside of the caved adit and minor indications (iron stains) this was drainage that seasonally drained northward towards Smiley Creek.

As with other mines, DEQ has arbitrarily designated the adits and waste dumps in order of their mapping and sampling. It should also be noted an unnamed adit was so designated because it appears it was driven more recently between the historic Solace and Emma workings on the Friend claim.

Photo 97. Between the Emma and the Solace adits is an "unnamed adit" that produced less than 500 cubic yards of waste and is producing some water which was sampled at Lat 43.79837ºN, Long. 114.84537ºW (sample UKADSW1). (Photo by Schuld 9/14/10)

The ponded adit discharge outside the unnamed adit was sampled (sample UKAD1SW1) and field parameters were collected.

Photo 98. Emma Adit #1 is a small caved tunnel of unknown depth. (Photo by B. Schuld)

Emma Adit #1, located at elevation 9071 and Lat. 43.79110ºN, Long. 114.84332ºW, appears to be driven on a vein with altered granodiorite and sulfides. The waste dump size is less than 500 cubic yards of wastes. There is no evidence of water in the adit.

The Emma Tunnel Adit (ETAD) apparently produced at least 2,000 cubic yards of sulfide bearing waste. This is a very rough estimate as the waste dump has been spread over a large area of ground, possibly two acres in size, by a bulldozer.

The vast majority of the waste rock is moderately altered granodiorite bearing massive sulfides.

Photo 99. Looking towards the collapsed Emma Tunnel Adit. (Photo by Schuld 9/15/10)

Photo 100. Looking up the length of the remaining Emma Waste Dump #2 towards the collapsed Emma Adit #2. (Photo by Schuld 9/15/10)

The Emma Adit #2, located at Lat. 43.79401ºN and Long. 114.84397ºW, is a small collapsed feature that produced less than 500 cubic yards of wastes. The adit was apparently driven on a

vein as altered granodiorite and sulfides are present. There is no surface water and no apparent connection to perennial flows.

The DEQ designated Emma Adit #3 is located at Lat. 43.79707ºN and Long. 114.84425ºW. It was later determined to most likely be the Emma Decline Shaft discussed in historical reports and on the Emma Plat map. The 80 feet of reported workings probably produced less than 200 cubic yards of waste. The dump has been obliterated by the main mine road to the east side of Smiley Canyon. The caved collar of the Emma Decline Shaft is just above the roadway.

Photo 101. The collapsed Emma Decline Shaft. (Photo by Schuld 9/15/10)

Photo 102. Looking down on the historic Emma Mine and cat cuts from Emma Adit #3. (Photo by Schuld 9/15/10)

Photo 103. Emma Adit #4. Waste Dump contains less than 200 cubic yards of waste. There is no evidence of water in adit. Lat. 43.79622ºN, Long.114.84341ºW (Photo by Elayer 9/15/10)

Photo 104. Emma Adit #4. Rock is composed mainly of granodiorite with some large chunks of ore. Waste dump is buried because of a bulldozer driven over the area. No evidence of water running from the adit. (Photo by Elayer 9/15/10)

Photo 105. Below Emma Adit #5 is a small bench and possibly where a loading platform was constructed. Perhaps the attempts to drive over to the Emma vein from this side of the mountain were partially successful.
(Photo by Schuld 9/15/10)

Photo 106. Collapsed Emma Adit #5. (Photo by Schuld 9/15/10)

Photo 107. Emma Adit and Waste Dump #6. (Photo by Schuld 9/15/10)

The Emma adits and waste dumps #4 through #6 are located on the west side of the claim and face of the ridge dividing the claim roughly in two. The adits were presumably driven as an attempt to intersect the Emma Vein (?) from the south. All three are small collapsed features with less than 500 cubic yards of waste on all of the waste dumps combined.

Photo 108. Collapsed Emma Adit #6. (Photo by Schuld 9/15/10)

8.7 Coleman Tunnel (aka Coleman Claim)

Like the Numa Tunnel, the Coleman Tunnel is not mentioned by this name in any historic documents or reports. DEQ has designated the tunnel the "Coleman" because of its location on the Coleman claim. Ross (1927) briefly describes the Solace Mine as having four lower levels

between the upper Solace Mine and the Webfoot Mine, presumably for dewatering and exploration. Ross's reference to a "Lower Solace" tunnel may have been because the tunnel was located on claims belonging to the Solace Group. However, as a matter of record, the tunnel DEQ has designated as the Coleman Tunnel appears to be driven beneath the Vienna mine workings and not the Solace Mine.

Regardless of the designation, the tunnel and waste dump were evaluated because of their adit discharge, waste volume, and connectivity to Smiley Creek. Because of the potential significance of the drainage, both through and around the dump to Smiley Creek, DEQ assessed the workings.

Photo 109. The Coleman Waste Dump contains significantly less than 1,000 cubic yards of waste rock dominated by slightly altered granodiorite. (Photo by Schuld 9/14/10)

Photo 110. Coleman Tunnel. (Photo by Schuld 9/15/10)

The Coleman Tunnel may have been an attempt to locate deep intercepts of either the Emma or Vienna veins. It appears from the waste rock that Ross's interpretation of the tunnels located on the Numa, Coleman, and Rebellion may be correct in that they may have been intended to provide a route for dewatering the production levels.

The Coleman Adit is partially collapsed, but it is discharging water at approximately 10 gpm (estimated). The discharge is running clear and there are no indications of acid generation or precipitates. Although the effluent is flowing freely on top of the dump it disappears into the waste dump, and there is no surficial evidence of connectivity to Smiley Creek, even though this is intuitive.

The effluent from the Coleman Tunnel and Waste Dump was sampled at Lat. 43.80418ºN, Long. 114.84769ºW (Sample COAD1SW1).

The Coleman Waste Dump is not typical of waste dumps in the Vienna Mining District. It contains approximately 1,000 cubic yards of waste with very few indications of alteration minerals or sulfides.

8.8 Rebellion Tunnel (aka Rebellion Claim)

The "Rebellion Tunnel" was designated by DEQ because there were no historical records providing a name to any tunnel on the Rebellion claim. However, Ross's 1927 description of four "lower Solace tunnels" may provide some initial reference and insight regarding the tunnel. Ross (1927) describes four lower levels of the Solace Mine located between the Solace and Webfoot mines. The tunnels were presumably intended to provide for dewatering of production levels in the upper Solace workings. This hypothesis may be applicable to the tunnel located on the Numa claim, but not those on the Coleman and Rebellion claims. These tunnels appear to be driven towards the area underlying the Vienna Mine and may have been intended to dewater those workings.

Photo 111. Rebellion Tunnel and Waste Dump viewed from the upper Emma Mine site. (Photo by Schuld 9/15/10)

Photo 112. Looking down on the Rebellion Waste Dump from the access road. (Photo by Schuld 9/15/10)

Photo 113. Cord wood stacked above the Rebellion Adit. (Photo by Schuld 9/15/10)

Photo 114. Collapsed Rebellion Adit. (Photo by Schuld 9/15/10)

The Rebellion Tunnel has a collapsed adit located at Lat. 43.80541ºN, and Long. 114.84924ºW. Although dry at the time of the investigation, there was evidence of an intermittent surface water pathway. Vegetation (sedges) is growing along the surface water pathway.

The Rebellion Waste Dump contains approximately 3,000 cubic yards of material The majority of the waste appears to be slightly altered granodiorite with few signs of alteration or sulfide minerals. A very small waste dump to the south has highly altered granodiorite and massive sulfides. The particles in this waste are well sorted and may have been run through a jig.

Because of the size of the primary waste dump, a composite sample was collected (sample RBWD1SS1).

Photo 115. Looking down the Rebellion Waste Dump towards the Webfoot Mine. (Photo by Schuld 9/15/10)

Photo 116. Adjacent to the main Rebellion Waste Dump is approximately 5 cubic yards of what appear to be jig tailings. (Photo by Schuld 9/15/10)

Photo 117. Adjacent to the main Rebellion Waste Dump is approximately 5 cubic yards of what appear to be jig tailings.
(Photo by Schuld 9/15/10)

8.9 Vienna District Minor Mine and Mill Sites

Although the Vienna Mining District is characterized by extensive mine development and production, there are numerous properties or claims upon which very little development has occurred other than road construction. These properties or claims are nonetheless important as they represent significant opportunities for future development.

Cargill and Alabama Mill Sites

Although the main access to the major mine and mill sites is through the Cargill and Alabama Mill Site claims, very little development or surface disturbance is present on the claims. The dominant feature is the locked agate and bridgework on the Cargill Mill Site that controls private property access.

Photo 118. Locked gate on Cargill Mill Site between the Wisconsin Mill Site and Webfoot Mine. (Photo by Schuld 9/13/10)

Although there are no observed risks to human health or the environment on the Cargill and Alabama Mill Sites, sediment and water samples were collected on the Cargill Mill Site. This was intended solely to segregate the potential affects to Smiley Creek from the Wisconsin Mill Site and the Webfoot Mine, which are located below and above the Cargill Mill Site, respectively. Samples SMCSD2 and SMCSW2 were collected at Lat. 43.81202ºN and Long. 114.83791ºW.

The sediment found at the sample location on the Cargill Mill Site was unremarkable. It consisted mainly of particles of slightly altered granodiorite with less than one percent organics and no obvious sulfides in and around the creek.

Alturas Claim

Although there is little historical discussions of developments on the Alturas claim, the view from the Upper Webfoot workings indicated there are at least some significant cat trenches cutting across the claim but no major mine dumps

Photo 119. View (left to right) of Rebellion, Flagstaff, Alturas, and California claims. (Photo by Schuld 9/17/10)

Nellie Extension Tunnel

Along the road that circumnavigates developments at the Vienna Mine there is a switchback on what appears to be the Nellie extension lode claim. At that switchback there is a small underground development that for lack of any historical reference DEQ refers to as the Nellie Extension Tunnel. The adit or "Nellie Tunnel" is partially open but limited in length and little remains of any significant waste dump.

Photo 120. The Nellie Extension Tunnel is a hazardous physical opening and access should be restricted or prevented. (Photo by Schuld 9/15/10)

Alturas and Nellie Patented Claim

Although access was granted to the Alturas claim by Mr. Allen Jones (Terrawiggly LLC), DEQ did not receive permission from Terrawiggly's co-owners. DEQ did not enter this claim, but was able to make sufficient observations of the claim from the Webfoot Mine's upper workings. Although historical records indicate at least two significant mine tunnels were located on the Alturas and adjacent Nellie patented claims, there are no apparent significant waste dumps. Typical of older developments throughout the Vienna Mining District, the claims have been dissected with extensive cat cuts, presumably to expose and explore outcrops for extensions of the Vienna vein system.

Photo 121. The Alturas claim has minor workings on it that seem to be dominated by the cat cuts seen above. (Photo by Schuld 9/15/10)

Photo 122. The Nellie Claim has minor workings on it that seem to be dominated by the cat cuts seen above. (Photo by Schuld 9/15/10)

Hidden Treasure, Alabama, Wisconsin, Cargill, Rosie and Lucre Patented Claims

Near the western boundary of the Hidden Treasure claim (Lat. 43.80425ºN, Long. 114.83765ºW) is a substantial exploration development on splays of vein work that may be an extension of those found at the Webfoot Mine. Considerable cat trenching has resulted in a large pit and waste dump where some precipitation accumulates. However, there does not appear to be any connection between the waste rock and surface water. The site is remote and appears to be rarely visited via the primitive access.

On the Vienna Creek side of the ridge, there are numerous cat trenches and exploration roads dissecting the Hidden Treasure, Alabama, Wisconsin, Cargill, Rosie and Lucre patented lode claims, but there were no indications of significant development noted.

Photo 123. Looking down into the Hidden Treasure exploration pit. (Photo by Schuld 9/15/10)

Photo 124. Looking southwest into the Hidden Treasure exploration pit. (Photo by Elayer 9/15/10)

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Section 9. Sample Collection and Analysis

9.1 Collection

The following samples were collected from the Vienna Mining District:

- Soil/Mine Waste – 13 samples
- Soil – 5 samples
- Sediment – 4 samples
- Water – 14 samples

Sample locations are shown on Figure 5.

The soil and sediment samples were sieved at the sample location, placed in properly marked 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 up gradient 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.

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 5.

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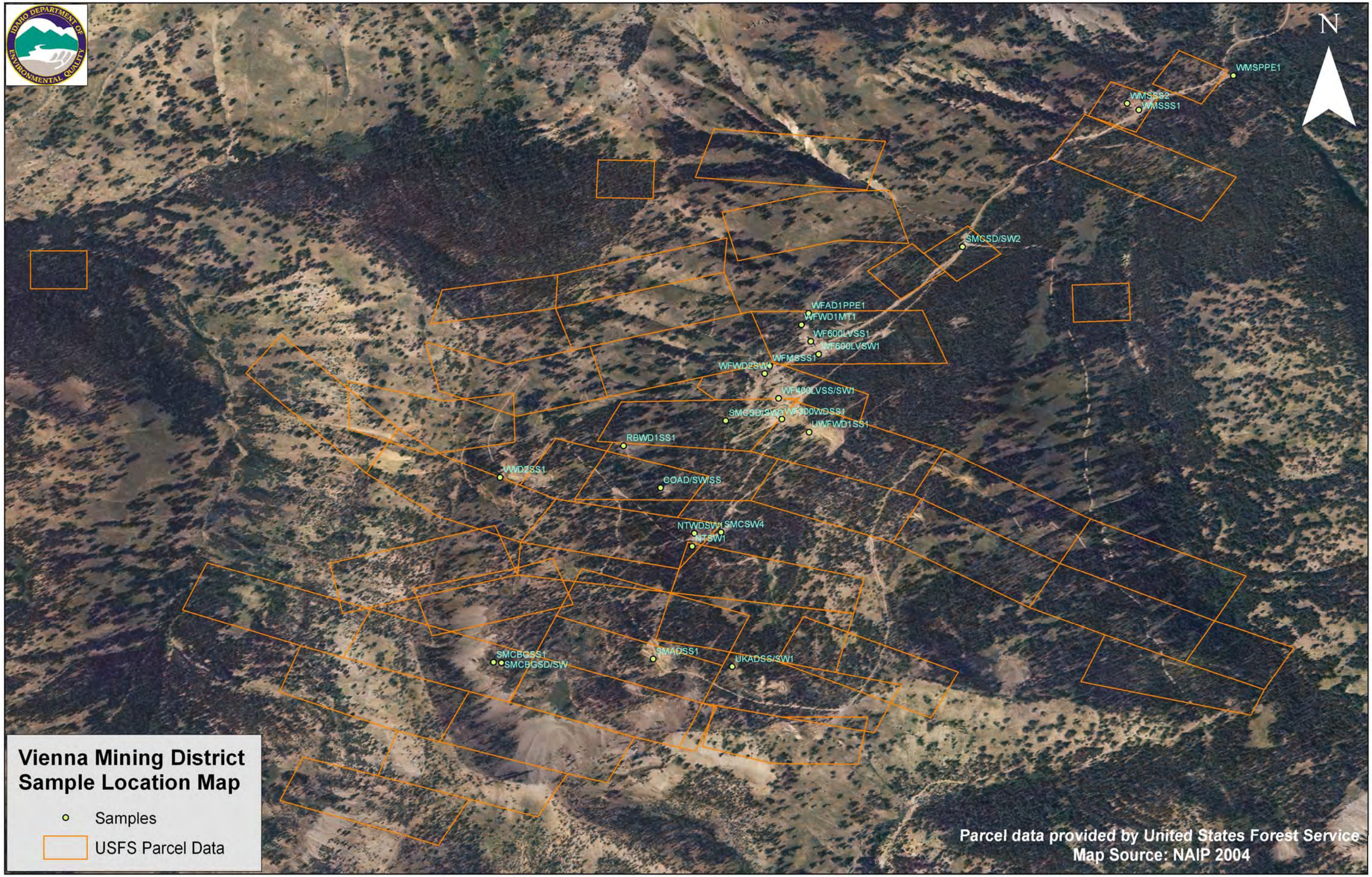

Figure 5. Sample Locations.

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Table 2. Soil and Waste Sample Analysis
Vienna Mining District

Metals	IDTLs (mg/kg)	HHSLs (mg/kg)	Smiley Creek Background Soils Sample SMCBGSS1 (mg/kg)	Wisconsin Mill Site Waste (Soils) Sample 1 WMSSS1 (mg/kg)	Wisconsin Mill Site Waste (Soils) Sample 2 WMSSS2 (mg/kg)	Webfoot Mine And Mill Site (Mill Tailings) WFWD1MT1 (mg/kg)	Webfoot Mine 600' Level Waste Dump WF600LVSS1 (mg/kg)
Antimony	4.77	31	<2.0	2.5	26.3	34.3	29.6
Arsenic	0.391	23	8.4	44.5	300	1430	2420
Barium	896	1600	96.5	58.5	549	20.9	48.7
Cadmium	1.35	39	0.48	0.66	1.42	**11***	2.93
Chromium	7.9	210	8.82	3.78	7.77	1.77	<0.60
Copper	921	2900	11.2	19.8	100	22.9	92.8
Iron		55000	15600	12800	17300	8470	23600
Lead	49.6		15.9	116	**342***	**492***	**4370***
Manganese	223	3600	908	332	3350	755	117
Selenium	2.03	23	<4.0	<4.0	<4.0	<4.0	<4.0
Silver	0.189	390	<0.50	5.5	68.5	36.5	84.7
Zinc	886	390	70.8	115	248	**1050***	289
Mercury	0.00509	23	<0.033	**33.7***	3.35	0.792	0.303

BOLD* indicates metals concentrations in soils exceed the BLM Ecological Risk Benchmarks.
Light Yellow = exceeds Idaho Initial Default Target Levels.
Bright Yellow = exceeds Human Health Screening Levels.
Purple = exceeds Background Levels by greater than three times.

Table 2 (continued). Soil and Waste Sample Analysis
Vienna Mining District

Metals	IDTLs (mg/kg)	HHSLs (mg/kg)	Smiley Creek Background Soils Sample SMCBGSS1 (mg/kg)	Webfoot Mine 400' Level Waste Dump WF400LVSS1 (mg/kg)	Webfoot Mine 300' Level Waste Dump WF300WDSS1 (mg/kg)	Upper Webfoot (100' Level) Waste Dump UWFWD1SS1 (mg/kg)	Webfoot Mill Site Soil Sample WFMSSS1 (mg/kg)
Antimony	4.77	31	<2.0	13.2	3.8	6.8	11.4
Arsenic	0.391	23	8.4	**1400***	**408***	**496***	**3340***
Barium	896	1600	96.5	72.1	99	167	154
Cadmium	1.35	39	0.48	**8.01***	2.62	0.94	**63.4***
Chromium	7.9	210	8.82	<0.60	<0.60	0.62	4.16
Copper	921	2900	11.2	25	10.4	16.4	**172***
Iron		55000	15600	15300	8110	10900	38200
Lead	49.6		15.9	**633***	**221***	**303***	**623***
Manganese	223	3600	908	740	512	109	11200
Selenium	2.03	23	<4.0	<4.0	<4.0	<4.0	9.1
Silver	0.189	390	<0.50	24.4	4.67	15.9	23.5
Zinc	886	390	70.8	**597***	178	112	**10000***
Mercury	0.00509	23	<0.033	0.64	0.085	0.19	0.785

BOLD* indicates metals concentrations in soils exceed the BLM Ecological Risk Benchmarks.
Light Yellow = exceeds Idaho Initial Default Target Levels.
Bright Yellow = exceeds Human Health Screening Levels.
Purple = exceeds Background Levels by greater than three times.

Table 2 (continued). Soil and Waste Sample Analysis
Vienna Mining District

Metals	IDTLs (mg/kg)	HHSLs (mg/kg)	Smiley Creek Background Soils Sample SMCBGSS1 (mg/kg)	Rebellion Waste Dump RBWD1SS1 (mg/kg)	Solace Mine Waste Dump SMADSS1 (mg/kg)	Unnamed Adit Waste Dump (Emma Mine?) UKAD1SS1 (mg/kg)	Vienna Mine Waste Dump #2 VMWD2SS1 (mg/kg)	Coleman Tunnel Waste Dump COWDSS1 (mg/kg)
Antimony	4.77	31	<2.0	2.2	61.8	<2.0	29.8	<2.0
Arsenic	0.391	23	8.4	**344***	**285***	**326***	**901***	50.8
Barium	896	1600	96.5	189	106	47.5	74.1	126
Cadmium	1.35	39	0.48	1.58	**15.8***	1.36	**2.16**	0.58
Chromium	7.9	210	8.82	0.73	<0.60	0.85	<0.60	2.9
Copper	921	2900	11.2	17.2	10.2	10.7	67.2	**15.2**
Iron		55000	15600	12800	6560	13700	11800	12200
Lead	49.6		15.9	115	**435***	**399***	**461***	37.2
Manganese	223	3600	908	404	44	548	274	540
Selenium	2.03	23	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Silver	0.189	390	<0.50	8.04	48.1	0.98	43.2	9.58
Zinc	886	390	70.8	191	**3840***	195	242	81
Mercury	0.00509	23	<0.033	0.428	0.67	0.133	0.735	0.125

BOLD* indicates metals concentrations in soils exceed the BLM Ecological Risk Benchmarks.
Light Yellow = exceeds Idaho Initial Default Target Levels.
Bright Yellow = exceeds Human Health Screening Levels.
Purple = exceeds Background Levels by greater than three times.

Table 3. Sediment Sample Analysis
Vienna Mining District

Metals	IDTLs (mg/kg)	HHSLs (mg/kg)	Smiley Creek Background Sediment Sample SMCBG1SD1 (mg/kg)	Wisconsin Mill Site PPE Sediment Sample WMSPPESD1 (mg/kg)	Webfoot Mine PPE Sediment Sample WFAD1PPESD1 (mg/kg)	Smiley Creek (below Webfoot) Sediment Sample SMCSD2 (mg/kg)	Smiley Creek (below Vienna) Sediment Sample SMCSD1 (mg/kg)
Antimony	4.77	31	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	0.391	23	3.8	7.6	75.3	70.8	25.2
Barium	896	1600	37.1	27.3	27.5	22.3	87.9
Cadmium	1.35	39	0.22	0.22	0.43	0.43	0.61
Chromium	7.9	210	1.98	2.46	<0.60	1.18	39.3
Copper	921	2900	1.87	1.52	1.93	2.29	11.8
Iron		55000	8070	7900	5720	6540	19500
Lead	49.6		15.9	10.3	15.6	18	22.6
Manganese	223	3600	122	167	170	191	379
Selenium	2.03	23	<4.0	<4.0	<4.0	<4.0	<4.0
Silver	0.189	390	<0.50	<0.50	0.81	0.74	1.17
Zinc	886	390	32.6	35.2	132	110	69.3
Mercury	0.00509	23	<0.033	0.227	<0.033	<0.033	0.21

BOLD* indicates metals concentrations in soils exceed the BLM Ecological Risk Benchmarks.
Light Yellow = exceeds Idaho Initial Default Target Levels.
Bright Yellow = exceeds Human Health Screening Levels.
Purple = exceeds Background Levels by greater than three times.

Table 4. 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"

Vienna 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 5. Total Recoverable Metals Analysis (mg/L)

(Concentrations expressed in mg/l unless otherwise stated)

Vienna Mining District

Description	DEQ Ground Water Standard (T)	DEQ Drinking Water Standard MCL	DEQ Cold Water Biota Standard Acute	DEQ Cold Water Biota Standard Chronic	Smiley Creek Background Surface Water Sample SMCBGSW1	Smiley Creek below Numa Tunnel Discharge SMCSW4	Smiley Creek above the Jones'Yurt and Webfoot Mine SMCSW3	Wisconsin Mill Site PPE WMSPPESW1	Webfoot Mine 400' Level Adit Discharge WF400LVSW1	Webfoot Mine Mill Site 500' Level Waste Dump WFWD2SW1	Webfoot Mine 600' Level Adit Discharge WF600LVSW1	Webfoot Mine PPE on Smiley Creek below 600' Level WFAD1PPESW1
Antimony					<0.020	<0.020	<0.020	<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	0.159	.084	0.219	<0.025
Barium	2	2			0.0028	0.0035	0.0076	0.0045	0.0051	0.0062	0.0055	0.0098
Cadmium	0.005	0.005	0.00082 (H)	0.00037 (H)	<0.0020	<0.0020	<0.0020	<0.0020	0.0032	0.0022	0.0024	<0.0020
Chromium (Total)	0.1	0.1			<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Copper	1.3		0.0046 (H)	0.0035 (H)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Iron	0.3*				<0.060	<0.060	<0.060	<0.060	1.01	0.481	0.566	<0.060
Lead	0.015	0.015	0.014 (H)	0.00054 (H)	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0085	<0.0075
Manganese	0.05				<0.0040	<0.0040	<0.0040	<0.0040	0.654	0.246	0.318	<0.0040
Selenium	0.05	0.05	0.018 (T)	0.005 (T)	<0.040	<0.040	<0.040	<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	<0.0050	<0.0050	<0.0050
Zinc	5*		0.035 (H)	0.032 (H)	<0.0100	<0.0100	<0.0100	<0.0100	0.646	0.397	0.542	0.0488
pH				6.5 - 9.0	7.23 su	7.79 su	7.01 su	7.09 su	7.66 su	7.79 su	7.30 su	7.41 su
Conductivity					0.013 µs/cm	0.136 µs/cm	0.120 µs/cm	0.093 µs/cm	0.239 µs/cm	0.233 µs/cm	0.262 µs/cm	0.145 µs/cm
Turbidity				<50	<10 NTU	<10 NTU	<10 NTU	<10 NTU	<10 NTU	<10 NTU	<10 NTU	<10 NTU
Dissolved Oxygen				>6	9.81 mg/l	12.96 mg/l	12.35 mg/l	12.18 mg/l	12.18 mg/l	11.39 mg/l	16.71 mg/l	12.29 mg/l
Temperature				<19	12.2º C	3.6ºC	5.3ºC	4.6ºC	4.4ºC	7.5ºC	7.3ºC	5.7ºC
Salinity					0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l

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

Exceeds Background Levels by greater than three times.

Table 5 (continued). Total Recoverable Metals Analysis (mg/L)

(Concentrations expressed in mg/l unless otherwise stated)

Vienna Mining District

Description	DEQ Ground Water Standard (T)	DEQ Drinking Water Standard MCL	DEQ Cold Water Biota Standard Acute	DEQ Cold Water Biota Standard Chronic	Numa Tunnel Adit Discharge NTADSW1	Numa Adit Waste Dump Discharge NTWD1SW1	Unnamed Adit Discharge between Emma and Solace Mines UKAD1SW1	Coleman Tunnel Adit Water Discharge COAD1SW1	Cargill Mill Site (below Webfoot Mine) Surface Water SMCSW2	Lower Smiley Creek (below Vienna Town Site) SMCSW1
Antimony					<0.020	<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	0.047	<0.025	<0.025
Barium	2	2			0.0023	0.0219	0.0038	0.0024	0.0068	0.0043
Cadmium	0.005	0.005	0.00082 (H)	0.00037 (H)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Chromium (Total)	0.1	0.1			<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Copper	1.3		0.0046 (H)	0.0035 (H)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Iron	0.3*				<0.060	<0.060	<0.060	<0.060	<0.060	0.079
Lead	0.015	0.015	0.014 (H)	0.00054 (H)	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Manganese	0.05				<0.0040	<0.0040	0.0068	<0.0040	<0.0040	<0.0040
Selenium	0.05	0.05	0.018 (T)	0.005 (T)	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Silver	0.1*		0.00032 (H)		0.0050	<0.0050	<0.050	<0.050	<0.050	<0.0050
Zinc	5*		0.035 (H)	0.032 (H)	0.0177	0.0173	<0.0100	<0.0100	0.0163	
pH				6.5 – 9.0	7.71 su	7.22 su	6.40 su	7.90 su	6.97 su	7.03 su
Conductivity					0.164 µs/cm	0.115 µs/cm	0.054 µs/cm	0.193 µs/cm	0.121 µs/cm	0.071µs/cm
Turbidity				<50 over BG	<10 NTU	<10 NTU	<10 NTU	<6 NTU	<10 NTU	55 NTU
Dissolved Oxygen				>6	12.44 mg/l	11.74 mg/l	8.88 mg/l	12.17 mg/l	11.76 mg/l	9.69 mg/l
Temperature				<19	3.6 ºC	5.3ºC	12.5ºC	4.9ºC	5.6ºC	6.0ºC
Salinity					0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l	0.0 mg/l

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

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 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). Analytical data will also be discussed relative to background concentrations found in soil sample SMCBGSS1.

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 Hailey and Ketchum area.

Background Soil

One background soil sample (SMCBGSS1) was collected above the pond in upper Smiley Creek Canyon on the border of the Solace and Pittsburg claims. Like most of the materials collected from assessed waste dumps, the soils collected at the background location contained a large portion of sandy-grained, slight to highly altered granodiorite with indications of massive sulfides, probably from the metaliferous outcrops of ore on the Pittsburg claim. Unlike any of the materials from assessed waste dumps, the soils collected at the background location contained 30 – 40% organic rich fines and debris.

Sample SMCBGSS1 of background soil exceeded IDTLs for total arsenic, chromium, and manganese by 21, 1.1, and 4 times, respectively. Due to the remoteness of the background site and the overall restrictions to public access to private land, this area does not pose substantial risks unless conditions change for use.

Wisconsin Mill Waste

Two soils (waste) samples (WMSSS1 and WMSSS2) were collected at the Wisconsin Mill Site. The first sample was typical of waste rock found on dumps throughout the Vienna Mining District. It appears light brown or buff colored. It was moderately altered granodiorite.

Sample WMSSS1 exceeded HHSLs for arsenic (by two times) and mercury (by more than 1.5 times). The sample also exceeded background levels for lead by over six times and mercury by over 1,000 times. Because of the proximity to the road way and unrestricted access by users of the Vienna Town Site and dispersed campground, human receptors are likely to be exposed. The concentrations also exceed ecological risk benchmarks for all listed animal receptors. Therefore, these wastes should be isolated or removed.

Sample WMSSS2 exceeds IDTLs and/or HHSLs for total antimony, arsenic, and mercury. The sample concentrations exceed background concentrations by greater than three times for antimony, arsenic, barium, cadmium, copper, lead, manganese, silver, zinc, and mercury. Lead concentrations exceed “median values” for ecological receptors by more than twice. Although this material is limited in volume, risks associated with these wastes would be significantly reduced if these wastes were isolated or removed.

Webfoot Mine and Mill Waste

A waste sample (WFWD1MT1) was collected in the mill tailings found at the base of the Webfoot 600’ Level Mine waste dump. There were less than 100 cubic yards of the fine grained (<100 mesh) wastes, but no organics were present in the material and vegetation was stressed on its surface and along the edges. The toe of the tailings piles encroached into the riparian community along Smiley Creek.

Metals concentrations in sample WFWD1MT1 exceeded IDTLs and/or HHSLs for total antimony, arsenic, lead, manganese, zinc, and mercury. Concentrations exceed background conditions by greater than three times for antimony, arsenic cadmium, lead, silver, zinc, and mercury. Concentrations of lead and zinc exceed “median values” for ecological receptors. Although this material is limited in volume, risks associated with these wastes would be significantly reduced if the waste were isolated or removed. Although there are no permanent residents at the site, the mine site safety and health plan should address how to prevent or minimize worker and part time resident exposures.

The Webfoot Mine waste dumps were also sampled at the 100’ (UWFWD1SS1), 300’ (WF300LVSS1), 400’ (WF400LVSS1) and 600’ (WF600LVSS1) levels. All of the samples contained indications of massive sulfides or oxides of sulfide minerals exposed to weathering. All of the samples were composite samples of at least 10 locations across the dumps. None of the samples contained significant organic material.

In sample UWFWD1SS1 total metals concentrations for antimony, arsenic, lead, and mercury exceeded IDTLs and/or HHSLs. These concentrations also exceed background conditions by greater than three times. Concentrations of total arsenic and lead exceed benchmark values for all ecological receptors. The waste volume on the 100’ Level Waste Dump is large (<2,500 cubic yards) and risks associated with these wastes would be significantly reduced if the waste were removed or isolated. Although there are no permanent residents at the site, the mine site safety and health plan should address how to prevent or minimize worker and part time resident exposures at this dump.

In sample WF300LVSS1 total metals concentrations for arsenic, cadmium, lead, manganese, and mercury exceeded IDTLs and/or HHSLs. These concentrations also exceed background conditions by greater than three times. Concentrations of total arsenic and lead exceed benchmark values for all ecological receptors. The waste volume on the 300’ Level Waste Dump is large (<2,500 cubic yards) and risks associated with these wastes would be significantly reduced if the waste were removed or isolated. Although there are no permanent residents at the site, the mine site safety and health plan should address how to prevent or minimize worker and part time resident exposures at this dump.

In sample WF400LVSS1 total metals concentrations for antimony, arsenic, cadmium, lead, manganese, zinc, and mercury exceeded IDTLs and/or HHSLs. These concentrations also exceed background conditions by greater than three times. Concentrations of total arsenic, cadmium, and lead exceed benchmark values for all ecological receptors. The waste volume on the 400' Level Waste Dump is large (<2,500 cubic yards) and risks associated with these wastes would be significantly reduced if the waste were removed or isolated. Although there are no permanent residents at the site, the mine site safety and health plan should address how to prevent or minimize worker and part time resident exposures at this dump.

In sample WF600LVSS1 total metals concentrations for antimony, arsenic, cadmium, lead, silver, and mercury exceeded IDTLs and/or HHSLs. These, in addition to copper, exceed background conditions by greater than three times. Concentrations of total lead exceed benchmark values for all ecological receptors. The waste volume on the 600' Level Waste Dump is large (<2,500 cubic yards) and risks associated with these wastes would be significantly reduced if the waste were removed or isolated. Although there are no permanent residents at the site, the mine site safety and health plan should address how to prevent or minimize worker and part time resident exposures at this dump.

Rebellion Tunnel Waste Rock

The Rebellion Tunnel Waste Dump was sampled (RBWD1SS1). The sample contained indications of massive sulfides or oxides of sulfide minerals exposed to weathering. The sample was a composite sample of at least 10 locations across the dump. It did not contain significant organic material.

In sample RBWD1SS1 total metals concentrations for arsenic, cadmium, lead, silver, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic only slightly exceed benchmark values for all ecological receptors. Due to the remoteness (relative to humans) and the small portion for the natural range for ecological receptors, it is very unlikely there are human health or ecological risks associated with this mine site.

Hope and Solace Mine Waste Rock

The waste dump on the Hope claim adjacent to the Solace Mine Adit was sampled (SMADSS1). The sample contained indications of massive sulfides or oxides of sulfide minerals exposed to weathering. The sample was a composite sample of approximately 20 locations across the dump. It did not contain significant organic material.

In sample SMADSS1 total metals concentrations for antimony, arsenic, cadmium, lead, silver, zinc, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic, cadmium, and lead exceed benchmark values for all ecological receptors. Due to the remoteness (relative to humans), it is very unlikely there are human health risks associated with this mine site. There are concerns relative to the ecological risks to all receptor groups, particularly for elk, mule deer, and big horn sheep. Therefore, DEQ recommends the dumps are either isolated or removed.

Emma Mine Wastes

The waste dump for an unnamed adit located roughly between the Emma Tunnel and the Solace Mine Adit was sampled (UKADSS1). The sample contained indications of massive sulfides or oxides of sulfide minerals exposed to weathering. The sample was a composite sample of locations across the dump. It did not contain significant organic material.

In sample UKADSS1 total metals concentrations for arsenic, cadmium, lead, manganese, silver, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic and lead exceed benchmark values for all ecological receptors. Due to the remoteness (relative to humans), it is very unlikely there are human health risks associated with this mine site. There are concerns relative to the ecological risks to all receptor groups, particularly for elk, mule deer, and big horn sheep. Therefore, DEQ recommends the dumps are either isolated or removed.

Vienna Mine Wastes

The Vienna Mine Waste Dump #2 was sampled (VMWD2SS1). The sample contained indications of massive sulfides or oxides of sulfide minerals exposed to weathering. The sample was a composite sample of approximately 20 locations across the dump. It did not contain significant organic material.

In sample VMWD2SS1 total metals concentrations for antimony, arsenic, cadmium, lead, silver, zinc, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic and lead exceed benchmark values for all ecological receptors. Although metals concentrations exceed IDTLs, HHSLs and benchmark values for ecological receptors, it is very unlikely, due to the remoteness (relative to humans) and the current land uses, there are human health risks associated with this mine site. There are concerns relative to the ecological risks to all receptor groups, particularly for elk, mule deer, and big horn sheep. Therefore, DEQ recommends the dumps are either isolated or removed.

Coleman Tunnel Waste Dump

The Coleman Tunnel Waste Dump was sampled (COWDSS1). The sample contained indications of massive sulfides or oxides of sulfide minerals exposed to weathering. The sample was a composite sample of at least 10 locations across the dump. It did not contain significant organic material.

In sample COWDSS1 total metals concentrations for arsenic, manganese, silver, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. None of the metals concentrations exceed benchmark values for all ecological receptors. Although metals concentrations exceed IDTLs, HHSLs, and benchmark values for ecological receptors, it is very unlikely, due to the remoteness (relative to humans) and the small portion of natural range for ecological receptors, there are human health or ecological risks associated with this mine site.

9.3 Sediment Analysis

Background Sediment

One background sediment sample (SMCBGSS1) was collected in the pond in upper Smiley Creek Canyon on the border of the Solace and Pittsburg claims. Metals concentrations in the background sample were unremarkable except for total arsenic which exceeded IDTLs by 10 times. Nevertheless, given the remoteness of the site and its current uses, no human health or ecological risks are evident.

Wisconsin Mill Site PPE

A sediment sample (WMSPPESD1) was collected on Smiley Creek below the PPE for the Wisconsin Mill Site. Metals concentrations in the sample were unremarkable except for total mercury which exceeded IDTLs by 10 times. Given the recreational use of the Old Vienna Town Site adjacent to the PPE, remedial work to abate the erosion of mill wastes at the Wisconsin Mill Site is warranted.

Webfoot Mine/Mill PPE

A sediment sample (WFAD1PPE1) was collected on Smiley Creek below the PPE for multiple entries at the Webfoot Mine. Metals concentrations in the sample exceeded IDTLs, HHSLs, and background conditions by greater than three times for total arsenic, silver, and zinc. Although metals concentrations exceeded IDTLs and HHSLs, ecological benchmarks were not. Due to the remoteness of the location and limited current use, it is unlikely human health or ecological risks exist. However, as stated in discussion of the Webfoot Mine waste analyses, concentrations do suggest potential risks warrant protection of site workers and reclamation of the mine waste dumps.

Cargill Mill Site Sediment

A sediment sample (SMCSD2) was collected on Smiley Creek in the Cargill Mill Site claim. Metals concentrations in the sample exceeded IDTLs, HHSLs, and background conditions by greater than three times for total arsenic, silver, and zinc. Although metals concentrations exceeded IDTLs and HHSLs, ecological benchmarks were not. Due to the remoteness of the location and limited current use, it is unlikely that human health or ecological risks exist. However, as stated in discussion of the Webfoot Mine waste analyses, concentrations do suggest potential risks warrant protection of site workers and reclamation of the mine waste dumps.

Lower Smiley Creek Sediment

A sediment sample (SMCSD1) was collected in the lower Smiley Creek meadows well below the mine sites, including the Old Vienna Town Site. Metals concentrations in the sample exceeded IDTLs, HHSLs, and background conditions by greater than three times for total arsenic, manganese, silver, and mercury. No concentrations exceeded ecological benchmarks.

Due to the remoteness of the location and limited current use, it is unlikely human health or ecological risks exist.

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

A background surface water quality sample (SMCBGSW1) was collected in the pond in upper Smiley Creek Canyon on the border of the Solace and Pittsburg claims. The background site had numerous indications of the mineralization typical of ore bodies in the area, and DEQ expected to see significant metals concentrations in the analysis. Field parameters measured at the site and laboratory analysis were unremarkable.

Smiley Creek Background Surface Water Samples Field Parameters (Samples SMCBGSD1, SMCBGSS1, and SMCBGSW1)	
pH	7.23 su
Conductivity	0.013 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	9.81 mg/l
Temperature	12.2ºC
Salinity	0.0 mg/l

Wisconsin Mill Site PPE Water

A surface water sample (WMSPPESW1) was collected on Smiley Creek just below where the runoff from the Wisconsin Mill Site would enter smiley Creek. Field parameters measures at the site and laboratory analysis were unremarkable.

Wisconsin Mill Site Probable Point of Entry (PPE) Field Parameters (Sample WMPPESW1)	
pH	7.09 su
Conductivity	0.093 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	12.18 mg/l
Temperature	4.6ºC
Salinity	0.0 mg/l

Webfoot Mine Water

A surface/ground water sample was collected from the adit discharge at the Webfoot 400' Level open adit. Concentrations of total cadmium, iron, manganese, and zinc exceed background levels by greater than three times and also cold water biota criteria. Field parameters measured at the site were unremarkable.

Webfoot 400' Level Adit Field Parameters (Sample WF400LVSW1)	
pH	7.66 su
Conductivity	0.239 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	12.18 mg/l
Temperature	4.4ºC
Salinity	0.0 mg/l

A surface water sample (WFWD2SW1) was collected beneath the Webfoot 500' Level Adit and Mill Site. Concentrations of total cadmium, iron, manganese, and zinc exceed background levels by greater than three times and also cold water biota criteria. Otherwise field parameters measured at the site and laboratory analysis for other metals were unremarkable.

Webfoot 500' Level Waste Dump Field Parameters (Sample WFWD2SW1)	
pH	7.79 su
Conductivity	0.233 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	11.39 mg/l
Temperature	7.5ºC
Salinity	0.0 mg/l

A surface/ground water sample (WF600LVSW1) was collected from the operating adit on the 600' Level of the Webfoot Mine. Concentrations of total cadmium, iron, manganese, and zinc exceed background levels by greater than three times and also cold water biota criteria. Barium also exceeds background levels by greater than three times. Otherwise field parameters measured at the site and laboratory analysis for other metals were unremarkable.

Webfoot 600' Level Adit Effluent Field Parameters (Sample WF600LVSW1)	
pH	7.30 su
Conductivity	0.262 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	16.71 mg/l
Temperature	7.3ºC
Salinity	0.0 mg/l

A surface water sample (WFADPPESW1) was collected on Smiley Creek below the PPE for multiple sources at the Webfoot Mine. Concentrations of total barium, iron, lead, and manganese exceed background levels by greater than three times.

Webfoot Mine/Mill Site PPE Field Parameters (Sample WFADPPE1)	
pH	7.41 su
Conductivity	0.145 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	12.29 mg/l
Temperature	5.7ºC
Salinity	0.0 mg/l

Although metals concentrations for cadmium, iron, manganese, and zinc in adit discharge from three levels of the Webfoot Mine exceed background levels and/or chronic cold water biota standards, metals concentrations in surface waters at the PPE do not. Therefore, it does not appear that metals concentrations in surface waters pose a risk to human health or an ecological risk. Nevertheless, they indicate some water management and source controls are warranted.

The adit discharge from the active mining operations to Smiley Creek is subject to regulation under Section 402 of the Clean Water Act which requires a National Pollution Discharge Elimination System Permit (NPDES) as administered by the EPA. However, based on the "in-stream" water quality analysis, it does not appear significant loading occurs from the adit discharge or waste dumps, and there are no violations of Idaho's Water Quality Standards. However, DEQ strongly suggests the operators design and implement a comprehensive water management system diverting adit water away from waste dumps and discharging to shallow infiltration systems into good soils and vegetated areas. DEQ also recommends surface water and adit discharge be routinely monitored at the Webfoot according to a formal water quality monitoring plan.

The operators should consider the administrative options and perhaps EPA to ensure appropriate actions. EPA's program information may be found at:

http://cfpub.epa.gov/npdes/doctype.cfm?sort=name&program_id=45&document_type_id=8

Numa Tunnel Water

A surface/ground water sample (NTADSW1) was collected outside the caved adit for the Numa Tunnel. Field parameters measured at the site and laboratory analysis were unremarkable.

Numa Tunnel Drainage Field Parameters (Sample NTADSW1)	
pH	7.71 su
Conductivity	0.164 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	12.44 mg/l
Temperature	3.6ºC
Salinity	0.0 mg/l

A surface water sample (NTWD1SW1) was collected from the seep below the Numa Tunnel waste dump. Total barium exceeds background levels by almost 10 times. Field parameters measured at the site and laboratory analysis for other metals were unremarkable.

Numa Waste Dump Seep Field Parameters (Sample NTWDSW1)	
pH	7.22 su
Conductivity	0.115 µs/cm
Turbidity	236 NTU
Dissolved Oxygen	11.74 mg/l
Temperature	5.3ºC
Salinity	0.0 mg/l

Upper Smiley Creek Water

A surface water sample (SMCSW4) was collected on Smiley Creek below the confluence with the adit drainage from the Numa Tunnel. Field parameters measured at the site and laboratory analysis were unremarkable.

Smiley Creek Field Parameters (Sample SMCSW4)	
pH	7.79 su
Conductivity	0.136 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	12.96 mg/l
Temperature	3.6ºC
Salinity	0.0 mg/l

A surface water sample (SMCSW3) was collected on Smiley Creek just above the Jones' family yurt. Field parameters measured at the site and laboratory analysis were unremarkable. Although Allen Jones has indicated an interest in development of a domestic water supply on Smiley Creek and even some of the adits (Numa, Coleman, Rebellion), DEQ suggests additional analysis be conducted, particularly for total fecal coliform, for this system.

Smiley Creek Above Jones Yurt Field Parameters (Sample SMCSW3)	
pH	7.01 su
Conductivity	0.129 µs/cm
Turbidity	<18 NTU
Dissolved Oxygen	12.35 mg/l
Temperature	5.3ºC
Salinity	0.0 mg/l

Emma Mine Water

Discharge from an unnamed adit located between the Emma and Solace mines was sampled (UKAD1SW1). Field parameters measured at the site and laboratory analysis were unremarkable.

Unnamed Adit Field Parameters (Sample UKAD1SW1)	
pH	6.40 su
Conductivity	0.054 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	8.88 mg/l
Temperature	12.5ºC
Salinity	0.0 mg/l

Coleman Tunnel Water

The surface/ground water discharge from the Coleman Tunnel adit was sampled (COAD1SW1). Field parameters measured at the site and laboratory analysis were unremarkable.

Coleman Adit Field Parameters (Sample COAD1SW1)	
pH	7.90 su
Conductivity	0.193 µs/cm
Turbidity	<6 NTU
Dissolved Oxygen	12.17 mg/l
Temperature	4.9ºC
Salinity	0.0 mg/l

Cargill Mill Site Water

A surface water sample (SMCSW2) was collected on the Cargill Mill Site claim at the entrance to the Jones' properties. Field parameters measured at the site and laboratory analysis were unremarkable.

Cargill Mill Site Field Parameters (Sample SMCSW2)	
pH	6.97 su
Conductivity	0.121 µs/cm
Turbidity	<10 NTU
Dissolved Oxygen	11.76 mg/l
Temperature	5.6ºC
Salinity	0.0 mg/l

Lower Smiley Creek Water

A surface water sample (SMCSW1) was collected in the lower Smiley Creek meadows. Field parameters measured at the site and laboratory analysis were unremarkable.

Smiley Creek Below Vienna Mine Field Parameters (Samples SMCSW1)	
pH	7.03 su
Conductivity	0.071 µs/cm
Turbidity	55 NTU
Dissolved Oxygen	9.69 mg/l
Temperature	6.0ºC
Salinity	0.0 mg/l

As indicated, water quality conditions in the upper Smiley Creek area, particularly "in-stream" conditions, appear good. However, as the sampling was conducted under low flow conditions, and concentration of metals in similar systems are usually higher just after peak flows in the spring, DEQ recommends water management systems at the Webfoot Mine are upgraded to divert adit discharges away from waste piles and through infiltration areas to provide additional buffering and attenuation by soils and vegetation.

Section 10. Pathways and Environmental Hazards

10.1 Surface Water Pathways

The surface water migration pathway target distance limit (TDL) begins at the probable point of entry of surface water runoff from a site to a surface water body and extends downstream for 15 miles. The surface water TDL for the Vienna Mining District is presented in Figure 6.

The probable point of entry starts on Smiley Creek at the Vienna Town Site and the PPE for the Wisconsin Mill Site. Smiley Creek is a tributary to the main Salmon River.

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 is only one domestic well and no public water system wells or their zones of capture located within the four mile radius of the Wisconsin Mill Site (Figure 6). The nearest domestic source is approximately 3.1 miles west and is segregated from the site by structural geology. The next nearest domestic well is located approximately eight miles down hydraulic gradient from the site in Sawtooth City. One public water system supplies 24 residents of Sawtooth City. According to the "Smiley Creek Water Users Association Inc. (PWS 5070087) – Source Water Assessment Final Report" the public drinking water supply is not influenced by the historic mine developments in Upper Smiley Creek.

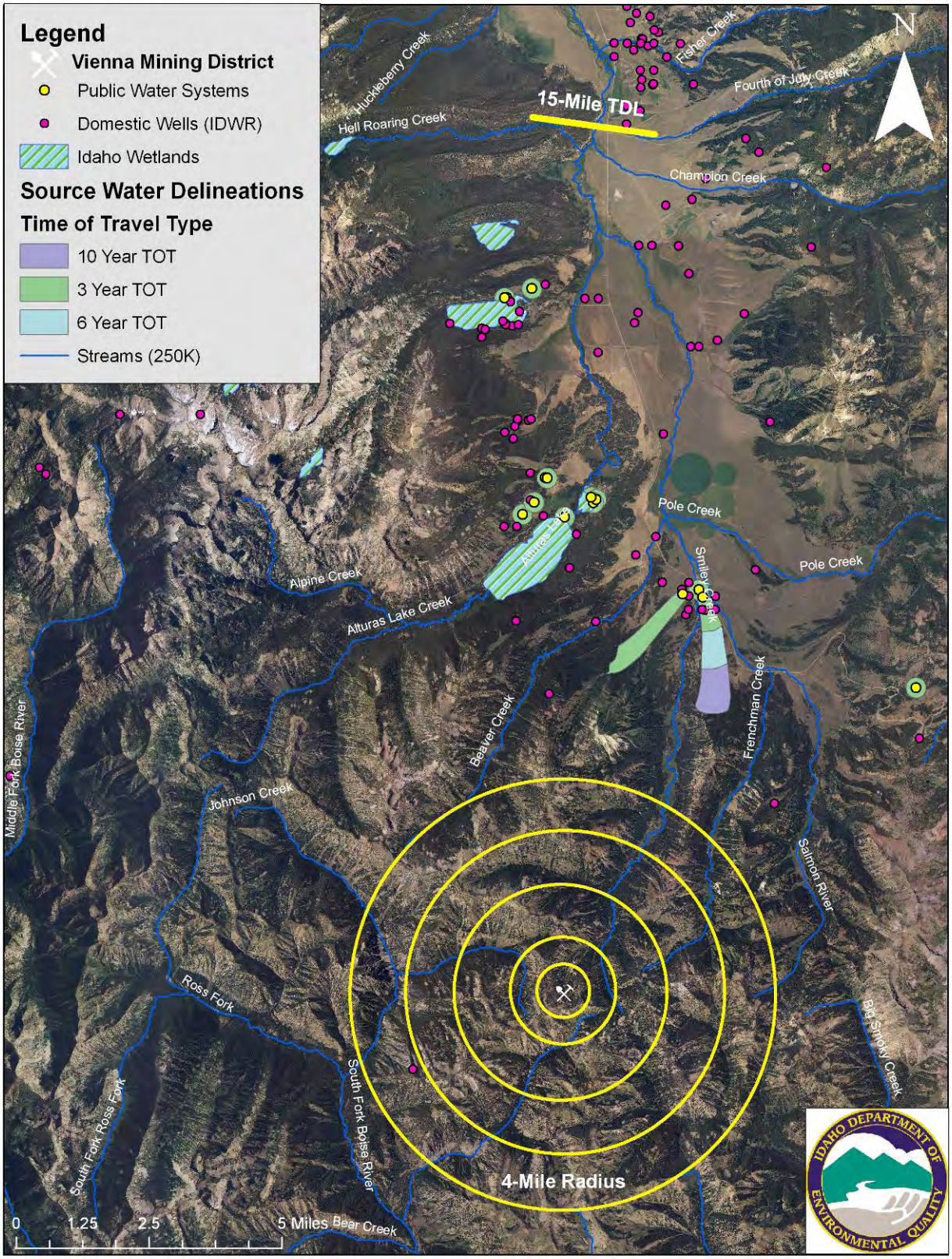

Figure 6. 15-Mile Target Distance Limit (TDL) and Domestic Wells (Map Source: NAIP 2004).

10.4 Air Quality Pathways

Public access is restricted to the entire mine and mill workings except at the Wisconsin Mill site. Four wheel drive trucks and off road vehicles (ORVs) travel to the Vienna Town Site and up to the gated property. The delivery of significant dust from the Wisconsin Mill Site to residents in Sawtooth City is unlikely except for those, who like other recreational users, go to and from the Vienna Town Site for hunting, camping or wood collection. It is unlikely those receptors receive significant doses from the rather small and stable mill site. Although there is a minor chance a recreational user visiting the Wisconsin Mill site could be exposed, duration would likely be very brief and the dose low. Mine workers at the Webfoot Mine are most likely to receive appreciable exposures via air 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.

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 for full-time residents. Because the mine sites have restricted access, except at the Wisconsin Mill Site where there is limited use or visits, soil pathways are incomplete for recreational users. However, temporary residents at the mine camp adjacent to the Webfoot 600' Level Adit are exposed and pathways appear to 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 residence is approximately eight miles north at Sawtooth City. There are no schools or day care facilities within 200 feet of this mine site.

10.7 Wetlands

There are no wetlands located in the immediate area of the Vienna Mining District sites (Figure 6). However, the lower Smiley Creek meadows begin approximately two miles below the Webfoot Mine. These meadows which do contain extensive riparian communities were observed

to contain what may be undocumented or classified small areas (<1 acre each) of wetlands extending six miles to the main Salmon River.

10.8 Sensitive Species (Plant and Animal)

Most of the sensitive species have huge ranges which overlap onto the Vienna 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 Wisconsin Mill Site, Webfoot Mine and Mill Site, Rebellion Tunnel, Emma Mine, Vienna Mine and Coleman Tunnel as indicated by the waste dump and sediment samples WMSS1, WMSSS2, WFWD1MT1, WF600LVSS1, WF400LVSS1, WF300WDSS1, UWFWD1SS1, WFMSSS1RBWD1SS1, SMADSS1, UKAD1SS1, VMWD2SS1, and COWDSS1.

Although they are likely to exist locally, no sensitive plant species have been documented to exist within the 4-mile radius of the Vienna Mine sites. (Figure 7).

The site is located within a defined range and habitat for Nez Perce and gray wolves. 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.

Boreal owls (*Aegolius funereus*) and fishers (*Martes pennanti*) are listed as sensitive species and have been observed within a four mile radius of the Vienna Mine sites.

Bull trout and sockeye salmon have been found in Trapper Creek (located in the northwest corner of the 4-mile radius on Figure 8) and the Middle Fork of the Salmon River. Bull trout and chinook salmon (spring run) can be found in Little Pistol Creek, which is the closest stream down gradient of the mine site. Bull trout are present in Pistol Creek (IDFG 2000).

Sensitive Species include:

- Westslope cutthroat trout (*Oncorhynchus clarki lewisi*)
- Bull trout (*Salvelinus confluentus*)
- Brook trout (*Salvelinus fontinalis*)
- Sockeye salmon (*Oncorhynchus nerka*, pop 1) (Snake River runs)
- Chinook salmon (*Oncorhynchus tshawytscha*, pop 2) (Fall/Spring/Summer runs)
- Steelhead (*Oncorhynchus mykiss*, pop 13)
- Rainbow trout (*Oncorhynchus mykiss*)
- Whitefish (*Prosopium* (var. sp.))
- Redband trout (*Oncorhynchus mykiss*)
- Sculpin (*Cottus* (var. species))

Sensitive Habitats include:

- Bull trout habitat
- Bull trout critical habitat - Salmon River - Alturas Lake Creek to headwater
- Chinook salmon habitat - Salmon River - Alturas Lake Creek to headwater

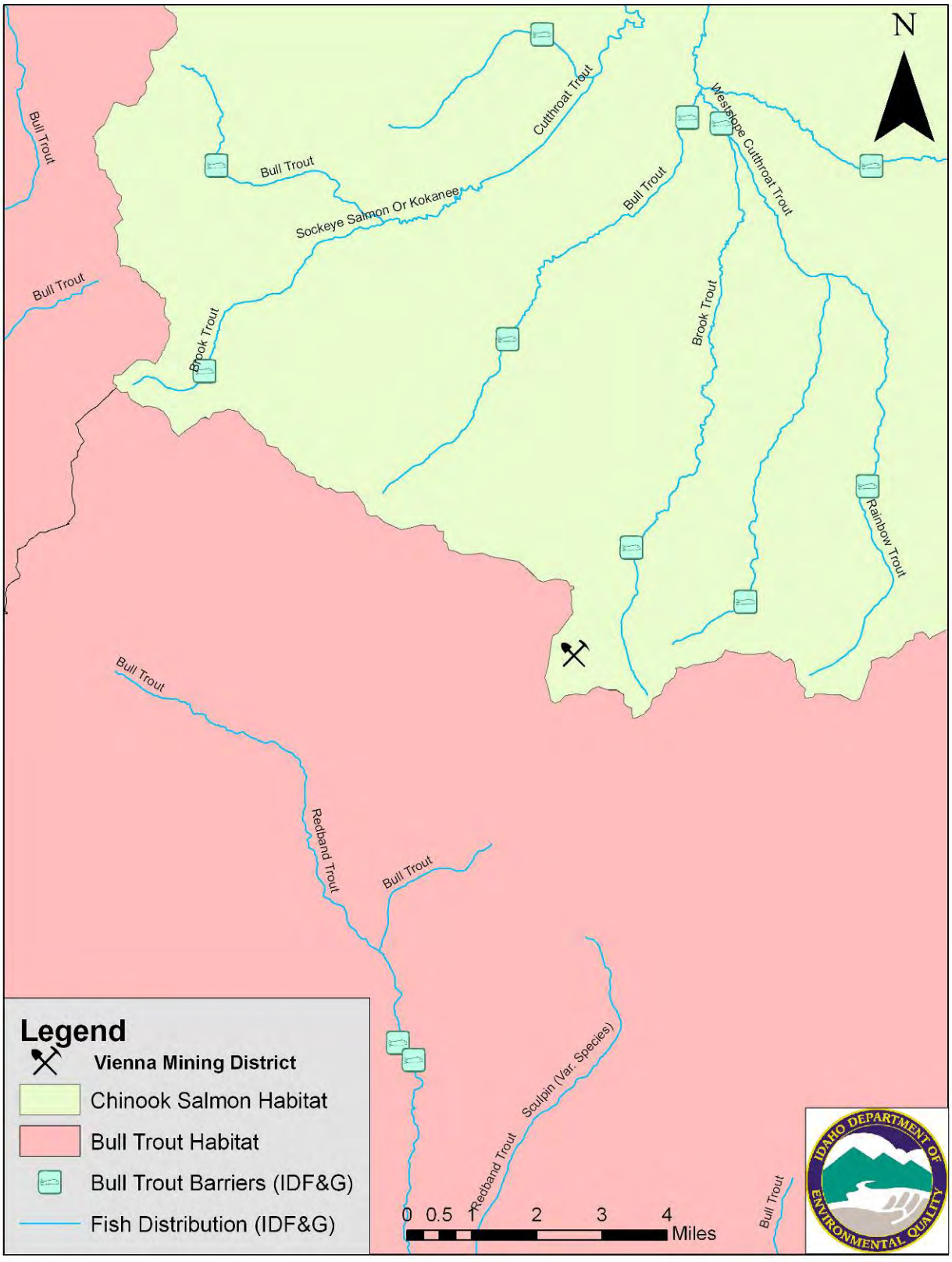

Figure 7. Vienna Mine District Fisheries

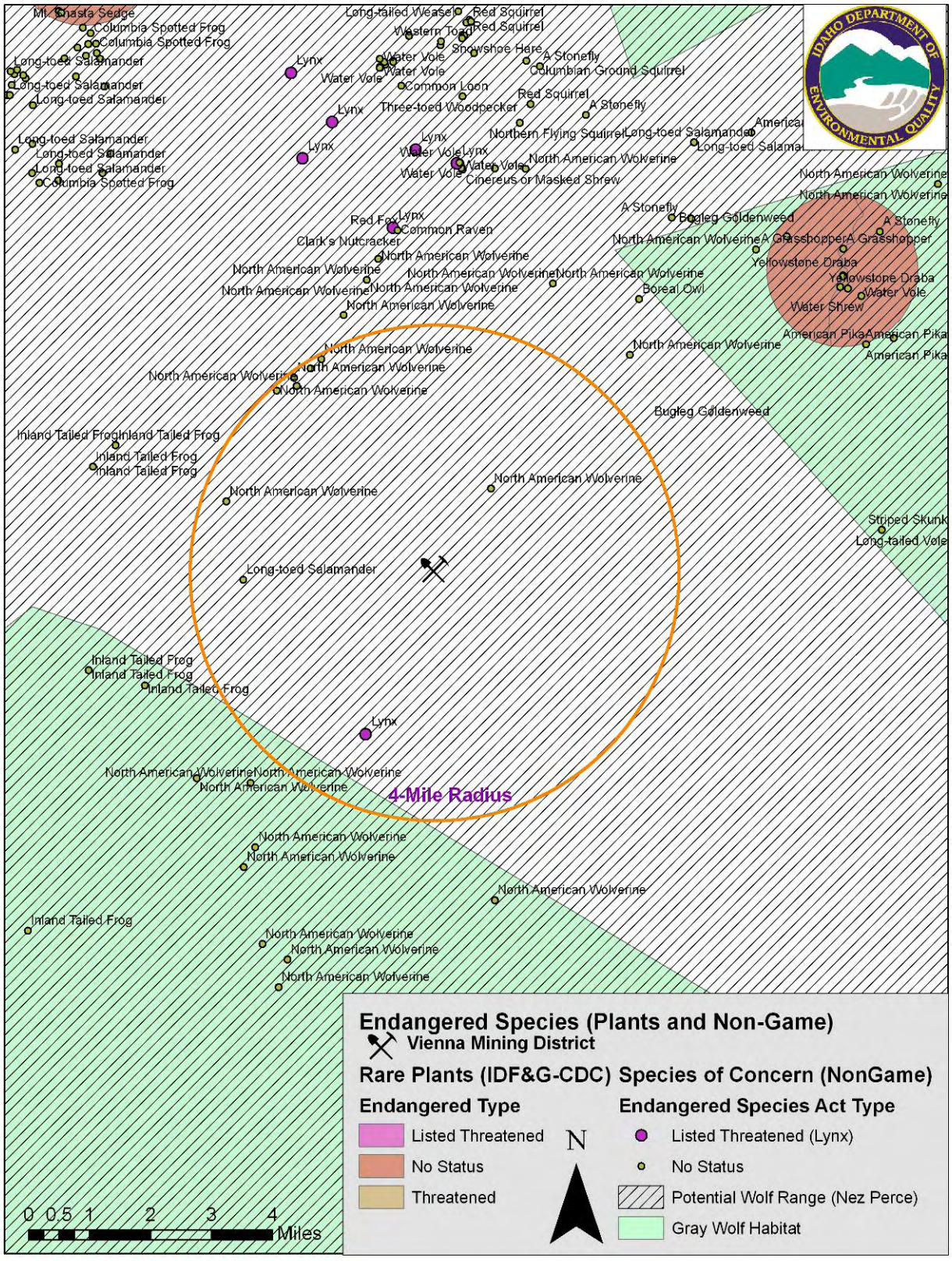

Figure 8. Endangered Species

Endangered Species Act List (Non-Game Species and Plants):

Threatened Species (non-game) within 4-mile radius:

Lynx (*Lynx canadensis*)

No Status Species within 4-mile radius:

Potential wolf range (Nez Perce)
North American wolverine (*Gulo gulo luscus*)
Long toed salamander (*Ambystoma macrodactylum*)

Non-Status Species outside of 4-mile radius:

Gray wolf habitat (Phantom Hill)
Gray wolf habitat (Galena)
Gray wolf habitat (Soldier Mountain)
Gray wolf habitat (Big Buck)
Columbia spotted frog (*Rana luteiventris*)
Flammulated owl (*Otus flammeolus*)
Red squirrel (*Tamiasciurus hudsonicus*)
American pika (*Ochotona princeps*)
Yellow-pine chipmunk (*Tamias amoenus*)
Boreal owl (*Aegolius funereus*)
A mayfly (*Ameletus sparsatus*) (*Parameletus columbiae*)
Columbian ground squirrel (*Spermophilus columbianus*)
A stonefly (*Bolshecapnia milami*) (*Pictetiella expansa*) (*Isoperla bifurcata*)
Golden-mantled ground squirrel (*Spermophilus lateralis*)
A grasshopper (*Argiacris militaris*)
Water shrew (*Sorex palustris*)
Water vole (*Microtus richardsoni*)
Snowshoe hare (*Lepus americanus*)
Yellow-pine chipmunk (*Tamias amoenus*)
Long-tailed vole (*Microtus longicaudus*)
Western jumping mouse (*Zapus princeps*)
Striped skunk (*Mephitis mephitis*)
Northern pocket gopher (*Thomomys talpoides*)
Yellow-bellied marmot (*Marmota flaviventris*)
Inland tailed frog (*Ascaphus montanus*)

Rare Plants (No Status):

None found within 4-mile radius:
Mt. Shasta Sedge (*Carex straminiformis*)
Sacajawea's Bitterroot (*Lewisia sacajaweana*)
Beautiful Bryum (*Bryum calobryoides*)
Blandow's Helodium (*Helodium blandowii*)
Bugleg Goldenweed (*Pyrrocoma insecticruris*)
Pale Sedge (*Carex livida*)
Yellowstone Draba (*Draba incerta*)
Giant Helleborine (*Epipactis gigantea*)

10.9 Sensitive Waterways

Approximately 20 miles of sensitive waterways are contained within the 15-mile TDL below the Vienna Mining District. However, information from routine monitoring and the EPA CWA 305b Report of Listed Streams indicates Smiley Creek and its tributaries, including Vienna Creek, are fully supported from mouth to source.

10.10 Livestock Receptors

Although livestock have traditionally been pastured on the open range around Smiley Creek, there were no indications this is a current practice in the watershed. Therefore, pathways or exposures for livestock are minimal including those to horses used by packers for hunting.

Section 11. Summary and Conclusions

Generally speaking toxicological risks to human and ecological receptors is limited to exposures to soils and sediment. Surface and ground water quality at various locations around the Vienna Mining District appears to be within acceptable ranges. There are numerous indications erosion is a serious concern. Furthermore, the site assessment was conducted during low flow/runoff conditions when it might be expected loading is at its lowest point. Exposure due to air pathways and dermal contact with soils appears to be likely for site workers but minimal for recreational users. Although risks at or down gradient to the site(s) appear minimal, DEQ is making numerous recommendations to the site owners and EPA to stabilize and manage risks at various locations in the Vienna Mining District.

11.1 Wisconsin Mill Waste

Samples WMSSS1 and WMSSS2 of the mill site exceeded HHSLs for arsenic (by two times) and mercury (by more than 1.5 times). The sample also exceeded background levels for lead by over six times and mercury by over 1,000 times. Because of the proximity to the roadway and unrestricted access by users of the Vienna Town Site and dispersed campground, human receptors are likely to be exposed. The concentrations also exceed ecological risk benchmarks for all listed animal receptors. Therefore, these wastes should be isolated reclaimed or removed.

Mercury concentrations in sediment at the Wisconsin Mill PPE exceeded IDTLs by 10 times. Given the recreational use of the Old Vienna Town Site adjacent to the PPE, remedial work to abate the erosion of mill wastes at the Wisconsin Mill Site is warranted. Figure 9 depicts two areas where culverts should be replaced to divert storm water and seasonal runoff from passing through the mill site.

DEQ is recommending to EPA a Hazard Ranking Score (HRS) be generated for this mill site and the owners work with DEQ to develop a reclamation or remedial action work plan to address the erosion and waste problems.

11.2 Webfoot Mine and Mill Waste

Metals concentrations in samples WFWD1MT1, UWFWD1SS1, and WF300LVSS1 exceeded IDTLs and/or HHSLs. Concentrations also exceed background conditions by greater than three times for antimony, arsenic cadmium, lead, silver, zinc, and mercury. Concentrations of lead and zinc exceed “median values” for ecological receptors. The total volume of waste for this mine is substantial, but risks associated with these wastes would be significantly reduced if the waste were isolated or removed. Although there are no permanent residents at the site, a mine site safely and health plan should address how to prevent or minimize worker and part time resident exposures.

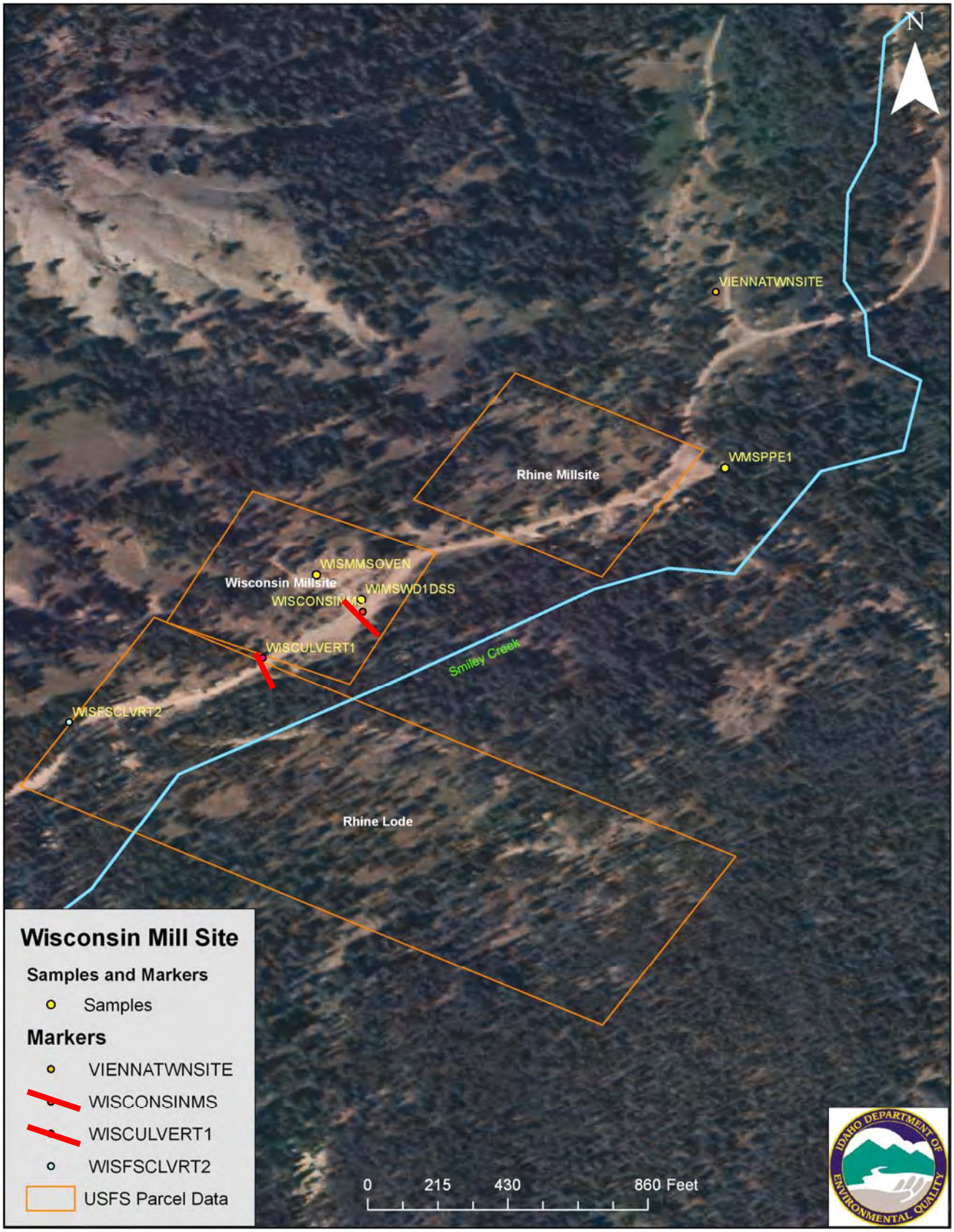

Figure 9. Wisconsin Mill Site Recommendations

DEQ is recommending EPA generate a HRS for the Webfoot Mine under CERCLA. However, most human health risks associated with this site could be addressed by a MSHA required mine site safety and health plan. In addition, water management systems, reclamation of mine waste dumps, and a formalized water quality monitoring and evaluation plan should be incorporated into the plan of operations. The owners/operators should coordinate with DEQ on these plans. Figure 10 depicts several suggestions regarding re-routing drainage and locations of sediment basins and infiltration galleries.

The Webfoot Mine discharge(s) to Smiley Creek is subject to regulation under Section 402 of the Clean Water Act which requires a NPDES permit as administered by the EPA. However, based on the "in-stream" water quality analysis, it does not appear significant loading occurs from the adit discharge or waste dumps, and there are no violations of Idaho's Water Quality Standards. However, DEQ strongly suggests the operators design and implement a comprehensive water management system diverting adit water away from waste dumps, and discharging to shallow infiltration systems into good soils and vegetated areas. DEQ also recommends surface water and adit discharge is routinely monitored at the Webfoot Mine according to a formal water quality monitoring plan.

The operators should consider the administrative options and perhaps EPA to ensure appropriate actions. EPA's program information may be found at:

http://cfpub.epa.gov/npdes/doctype.cfm?sort=name&program_id=45&document_type_id=8

11.3 Rebellion Tunnel Waste Rock

In sample RBWD1SS1 total metals concentrations for arsenic, cadmium, lead, silver, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic only slightly exceed benchmark values for all ecological receptors. Due to the remoteness (relative to humans) and the small portion for the natural range for ecological receptors, it is very unlikely there is human health or ecological risks associated with this mine site. DEQ is recommending to EPA this site be classified as No Remedial Action Planned (NRAP).

11.4 Hope and Solace Mine Waste Rock

In sample SMADSS1 total metals concentrations for antimony, arsenic, cadmium, lead, silver, zinc and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic, cadmium, and lead exceed benchmark values for all ecological receptors. Due to the remoteness (relative to humans), it is very unlikely there are human health risks associated with this mine site. There are concerns relative to the ecological risks to all receptor groups, particularly for elk, mule deer, and big horn sheep. Therefore, DEQ recommends to the site owners the waste dumps are isolated, reclaimed, or removed. However, DEQ also recommends to EPA this site is classified as NRAP.

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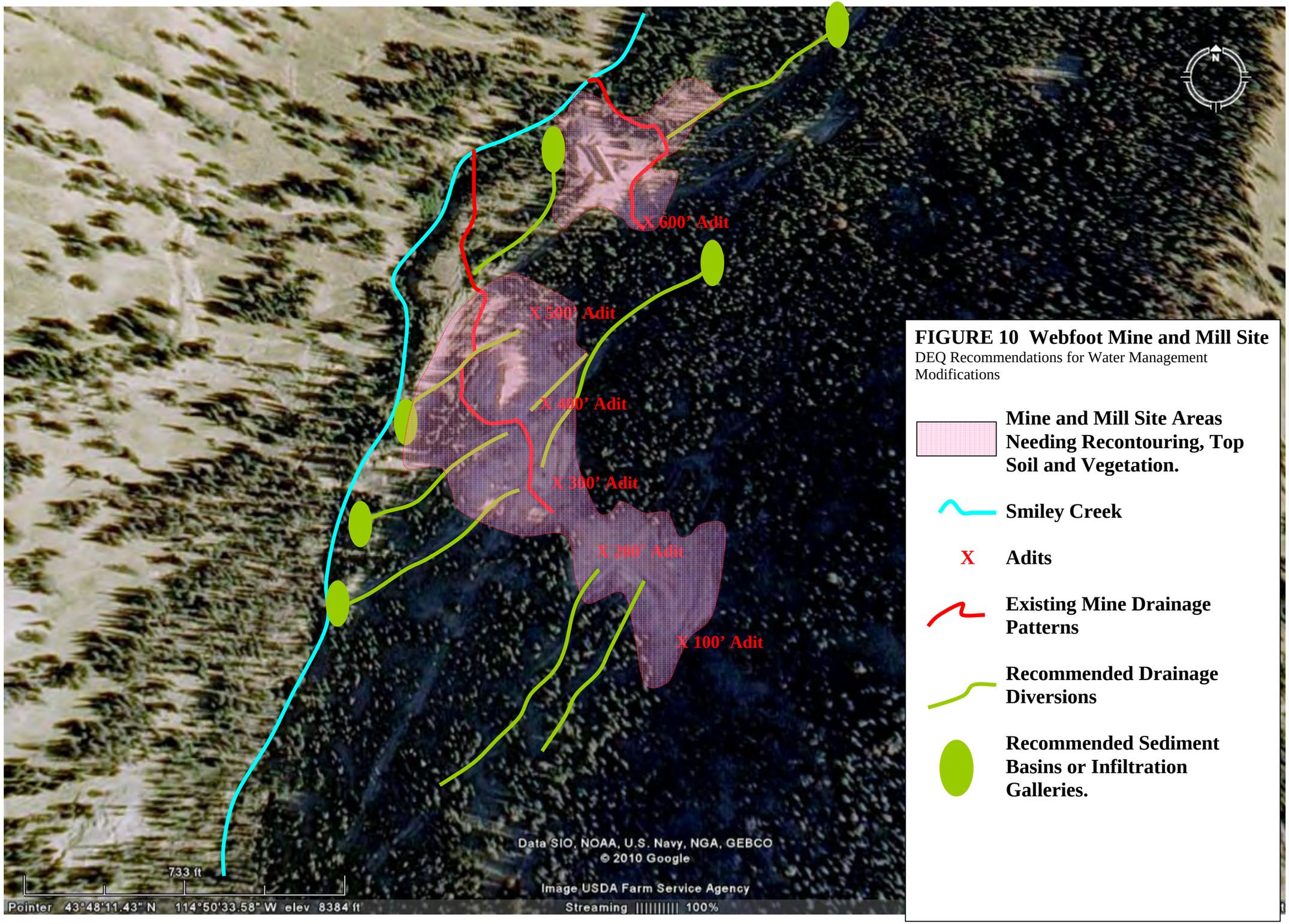

FIGURE 10 Webfoot Mine and Mill Site
DEQ Recommendations for Water Management Modifications

Mine and Mill Site Areas Needing Recontouring, Top Soil and Vegetation.

Smiley Creek

X **Adits**

Existing Mine Drainage Patterns

Recommended Drainage Diversions

Recommended Sediment Basins or Infiltration Galleries.

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11.5 Emma Mine Waste Rock

In sample UKADSS1 total metals concentrations for arsenic, cadmium, lead, manganese, silver, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic and lead exceed benchmark values for all ecological receptors. Due to the remoteness (relative to humans), it is very unlikely there are human health risks associated with this mine site. There are concerns relative to the ecological risks to all receptor groups, particularly for elk, mule deer, and big horn sheep. Therefore, DEQ recommends to the site owners the waste dumps are isolated, reclaimed, or removed. However, DEQ is recommending to EPA the site be classified as NRAP.

11.6 Vienna Mine Waste Rock

In sample VMWD2SS1 total metals concentrations for antimony, arsenic, cadmium, lead, silver, zinc, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. Concentrations of total arsenic and lead exceed benchmark values for all ecological receptors. Although metals concentrations exceed IDTLs, HHSLs, and benchmark values for ecological receptors, it is very unlikely, due to the remoteness (relative to humans) and the current land uses, there are human health risks associated with this mine site. There are concerns relative to the ecological risks to all receptor groups, particularly for elk, mule deer, and big horn sheep. Therefore, DEQ recommends to the owner the waste dumps are isolated, reclaimed, or removed. However, DEQ is recommending to EPA the site be classified as NRAP.

11.7 Coleman Tunnel Waste Dump

In sample COWDSS1 total metals concentrations for arsenic, manganese, silver, and mercury exceeded IDTLs and/or HHSLs. These metal concentrations exceeded background conditions by greater than three times. None of the metals concentrations exceed benchmark values for all ecological receptors. Although metals concentrations exceed IDTLs, HHSLs, and benchmark values for ecological receptors, it is very unlikely, due to the remoteness (relative to humans) and the small portion for the natural range for ecological receptors, there are human health or ecological risks associated with this mine site. DEQ is recommending to EPA the site be classified as NRAP.

11.8 Cargill Mill Site Sediment

A sediment sample (SMCSD2) was collected on Smiley Creek in the Cargill Mill Site claim. Metals concentrations in the sample exceeded IDTLs, HHSLs, and background conditions by greater than three times for total arsenic, silver, and zinc. Although metals concentrations exceeded IDTLs and HHSLs, ecological benchmarks were not. Due to the remoteness of the location and limited current use, it is unlikely human health or ecological risks exist. However, as stated in discussion of the Webfoot Mine waste analyses, concentrations do suggest potential risks warrant protection of site workers and reclamation of the mine waste dumps. However, DEQ is recommending to EPA the site be classified as a NRAP.

11.9 Lower Smiley Creek Sediment

A sediment sample (SMCSD1) was collected in the lower Smiley Creek meadows well below the mine sites, including the Old Vienna Town Site. Metals concentrations in the sample exceeded IDTLs, HHSLs, and background conditions by greater than three times for total arsenic, manganese, silver, and mercury. No concentrations exceeded ecological benchmarks. Due to the remoteness of the location and limited current use, it is unlikely human health or ecological risks exist.

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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

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:	IDEQ
Contact:	Tina Elayer
Address:	1410 N. Hilton Boise, ID. 83706
Phone Number.	(208) 373-0563
FAX Number	(208) 373-0154
E-mail.	tina.elayer@deq.idaho.gov

Invoice Sent To:	Same as Report to
Contact:	
Address:	
Phone Number:	
FAX Number:	
PO#:	

Project Name: Vienna Group

Sampler's Signature: Tina Elayer

Indicate State of sample origination: ID

USACE? ☐ Yes ☒ No

Please take care to distinguish between:
1 and I
2 and Z
5 and S
Ø and O
Thanks!

	Sample ID	Collection: Date	Collection: Time	Collected by: (Init.)	Misc.: Matrix Type (From Table 1)	Misc.: No. of Containers	Preservative(s): Unpreserved	Preservative(s): HNO_3 Filtered	Preservative(s): HNO_3 Unfiltered	Preservative(s): HCl	Preservative(s): H_2SO_4	Preservative(s): NaOH	Preservative(s): Other (Specify)	Analyses Required: RCRA 8	Copper	Iron	Manganese	Zinc	Antimony	Rush Instructions (Days)
1	SMCBG1SW1	9/14/10	13:58	TE	1	1			X					X	X	X	X	X	X	
2	WMSPPE1	9/14/10	8:30	BS	1	1			X											
3	SMCSW3	9/14/10	11:54	BS	1	1			X											
4	SMCSW2	9/14/10	8:15	TE	1	1			X											
5	WFADIPPE1SW1	9/14/10	10:49	TE	1	1			X											
6	COADISW1	9/14/10	13:29	TE	1	1			X											
7	WFWD2SW1	9/14/10	11:35	TE	1	1			X											
8	UKADISW1	9/14/10	15:54	TE	1	1			X											
9	SMCSW1	9/14/10	8:00	BS	1	1			X											
10	NTSW1	9/14/10	12:40	TE	1	1			X											

Comments
- Total metals on all H_2O samples.
- All soil/Sed sieved to 9mesh

Relinquished by: Tina Elayer	Date: 9/22/10	Time: 10:00am	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☒ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 9/05

CHAIN OF CUSTODY RECORD

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

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: IDEQ	**Invoice Sent To:** Same as Report to
Contact: Tina Eleyer	Contact:
Address: 1410 N. Hilton, Boise, ID 83706	Address:
Phone Number: (208) 373-0563	Phone Number:
FAX Number: (208) 373-0154	FAX Number:
E-mail: tina.eleyer@deq.idaho.gov	PO#:

Project Name: Yuma Group

Sampler's Signature: Tina Eleyer

Indicate State of sample origination: ID USACE? ☐ Yes ☒ No

	Sample ID (Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, Ø and O. Thanks!)	Collection: Date	Collection: Time	Collected by: (Init.)	Misc.: Matrix Type (From Table 1)	Misc.: No. of Containers	Preservative(s): Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify)	Analyses Required: XRF 8	Copper	Iron	Manganese	Zinc	Antimony	Rush Instructions (Days)	Comments
1	SMCSW4	9/14/10	12:40	BS	1	1			X					X	X	X	X	X	X		- Total metals on all H2O Samples. - All soil/sed sieved to 9 mesh
2	NTWDSW1	9/14/10	12:58	BS	1	1			X												
3	COWDSS1	9/14/10	13:20	BS	3	1	X														
4	UKADISS1 ✓	9/14/10	15:50	BS	3	1	X														
5	WFWDIMT1 ✓	9/14/10	11:00	BS	3	1	X														
6	SMADSS1 ✓	9/14/10	14:20	BS	3	1	X														
7	SMCBGSS1 ✓	9/14/10	13:55	BS	3	1	X														
8	WFADIPPE1 ✓	9/14/10	10:50	BS	3	1	X														
9	WMSPPESD1 ✓	9/14/10	8:32	BS	3	1	X														
10	SMCSD2 ✓	9/14/10	8:15	BS	3	1	X														

Relinquished by: Tina Eleyer	Date: 9/22/10	Time: 10:00	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☒ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

CHAIN OF CUSTODY RECORD

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

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:	IDEQ
Contact:	Tina Eckyer
Address:	1410 N. Hilton Boise, ID 83706
Phone Number:	(208) 373-0563
FAX Number	(208) 373-0154
E-mail:	tina.eckyer@deq.idaho.gov
Invoice Sent To:	Same as Report to
Contact:	
Address.	
Phone Number	
FAX Number.	
PO#:	

Project Name: Vienna Group

Sampler's Signature: Tina Eckyer

Indicate State of sample origination: ID **USACE?** ☐ Yes ☒ No

	Sample ID	Collection			Misc.		Preservative(s)							Analyses Required							Rush Instructions (Days)	Comments
	Please take care to distinguish between: 1 and I 2 and Z 5 and S Ø and O Thanks!	Date	Time	Collected by: (Init.)	Matrix Type (From Table 1)	No. of Containers	Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify)	RCRA 8	Copper	Iron	Manganese	Zinc	Antimony			
1	WMSSS2 ✓	9/14/10	9:10	BS	3	1	X							X	X	X	X	X	X			-Total metals on all H_2O samples. -All soil/sed samples sieved to 9 mesh.
2	WMSSS1 ✓	9/14/10	9:00	BS	3	1	X															
3	SMCBG1SD1 ✓	9/14/10	13:58	TE	3	1	X															
4	SMCSD1 ✓	9/14/10	8:05	BS	3	1	X															
5	VWD2SS1 ✓	9/15/10	13:00	BS	3	1	X															
6	RBWD1SS1 ✓	9/15/10	14:00	BS	3	1	X															
7	UWFWD1SS1 ✓	9/16/10	9:42	BS	3	1	X															
8	WFMSSS1 ✓	9/16/10	14:00	BS	3	1	X															
9	WF600LVSS1 ✓	9/16/10	13:40	BS	3	1	X															
10	WF400LVSS1 ✓	9/16/10	10:40	BS	3	1	X															

Relinquished by:	Tina Eckyer	Date: 9/22/10	Time: 10:00	Received by.	Date. Time:
Relinquished by:		Date:	Time:	Received by:	Date: Time:

* Sample Reject: ☐ Return ☐ Dispose ☒ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

CHAIN OF CUSTODY RECORD

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

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: INEL
Contact: Tina Elayer
Address: 1410 N. Hilton
Boise, ID. 83706
Phone Number: (208) 373-0563
FAX Number: (208) 373-0154
E-mail: tina.elayer@deq.idaho.gov

Invoice Sent To: Same as Report to
Contact:
Address:
Phone Number:
FAX Number:
PO#:

Project Name: Vinna Group
Sampler's Signature: Tina Elayer

Indicate State of sample origination: ID USACE? ☐ Yes ☒ No

	Sample ID (Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, Ø and O. Thanks!)	Collection Date	Collection Time	Collected by: (Init.)	Misc. Matrix Type (From Table 1)	Misc. No. of Containers	Preservative(s) Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify)	Analyses Required: RCRA 8	Copper	Iron	Manganese	Zinc	Antimony	Rush Instructions (Days)	Comments
1	WF300WDSS1	9/11/10	10:20	BS	3	1	X							X	X	X	X	X	X		- Total metals on unfiltered H_2O Samples. - All Soil/Sediment Samples sieved with 9 mesh.
2	WF600LVSW1	9/11/10	13:30	TE	1	1			X					1	1	1	1	1	1		Total
3	WF400LVSW1	9/11/10	11:04	BS	1	1			X					1	1	1	1	1	1		Total
4																					
5																					
6																					
7																					
8																					
9																					
10																					

Relinquished by: Tina Elayer	Date: 11/22/10	Time: 10:00	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☒ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

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 **W0I0613**
Reported: 08-Oct-10 12:03

Client Sample ID: **WF300WDSS1**
SVL Sample ID: **W0I0613-19 (Soil)**

Sampled: 16-Sep-10 10:22
Received 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	3 8	mg/kg	2.0	0.3		W040304	AS	10/07/10 16:58	
EPA 6010B	**Arsenic**	408	mg/kg	2 5	0 4		W040304	AS	10/07/10 16:57	
EPA 6010B	**Barium**	99 0	mg/kg	0.20	0.02		W040304	AS	10/07/10 16:57	
EPA 6010B	**Cadmium**	2 62	mg/kg	0 20	0 03		W040304	AS	10/07/10 16:57	
EPA 6010B	Chromium	< 0 60	mg/kg	0.60	0.07		W040304	AS	10/07/10 16 58	
EPA 6010B	**Copper**	10.4	mg/kg	1 00	0.21		W040304	AS	10/07/10 16:57	
EPA 6010B	**Iron**	8110	mg/kg	6.0	1 5		W040304	AS	10/07/10 16:56	
EPA 6010B	**Lead**	221	mg/kg	0 75	0.36		W040304	AS	10/07/10 16.57	
EPA 6010B	**Manganese**	512	mg/kg	0 40	0 09		W040304	AS	10/07/10 16:56	
EPA 6010B	Selenium	< 4 0	mg/kg	4.0	1.0		W040304	AS	10/07/10 16 58	
EPA 6010B	**Silver**	4.67	mg/kg	0.50	0 04		W040304	AS	10/07/10 16:57	
EPA 6010B	**Zinc**	178	mg/kg	1.00	0.22		W040304	AS	10/07/10 16:57	
EPA 7471A	**Mercury**	0 085	mg/kg	0 033	0 010		W040060	JAA	09/30/10 14 25	
Percent Solids										
Percent Solids	**% Solids**	97 0	%	0.1			W041075	DP	10/05/10 10:31	

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: **W0I0613**
Reported: 08-Oct-10 12.03

Client Sample ID: **WF400LVSS1**
SVL Sample ID: **W0I0613-18 (Soil)**

Sampled: 16-Sep-10 10:40
Received: 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	13.2	mg/kg	2.0	0.3		W040304	AS	10/07/10 16 52	
EPA 6010B	**Arsenic**	1400	mg/kg	2.5	0 4		W040304	AS	10/07/10 16:52	
EPA 6010B	**Barium**	72 1	mg/kg	0 20	0 02		W040304	AS	10/07/10 16:52	
EPA 6010B	**Cadmium**	8.01	mg/kg	0 20	0 03		W040304	AS	10/07/10 16:52	
EPA 6010B	Chromium	< 0.60	mg/kg	0.60	0.07		W040304	AS	10/07/10 16.52	
EPA 6010B	**Copper**	25.0	mg/kg	1.00	0 21		W040304	AS	10/07/10 16:52	
EPA 6010B	**Iron**	15300	mg/kg	6 0	1.5		W040304	AS	10/07/10 16 50	
EPA 6010B	**Lead**	633	mg/kg	0 75	0 36		W040304	AS	10/07/10 16:52	
EPA 6010B	**Manganese**	740	mg/kg	0.40	0.09		W040304	AS	10/07/10 16.50	
EPA 6010B	Selenium	< 4 0	mg/kg	4.0	1 0		W040304	AS	10/07/10 16:52	
EPA 6010B	**Silver**	24.4	mg/kg	0 50	0.04		W040304	AS	10/07/10 16:52	
EPA 6010B	**Zinc**	597	mg/kg	1.00	0.22		W040304	AS	10/07/10 16:52	
EPA 7471A	**Mercury**	0 640	mg/kg	0.033	0.010		W040060	JAA	09/30/10 14 24	
Percent Solids										
Percent Solids	**% Solids**	97.8	%	0.1			W041075	DP	10/05/10 10:31	

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: **W0I0613**
Reported: 08-Oct-10 12 03

Client Sample ID: **WF600LVSS1**
SVL Sample ID: **W0I0613-17 (Soil)**

Sample Report Page 1 of 1

Sampled: 16-Sep-10 13:40
Received: 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	29 6	mg/kg	2.0	0.3		W040304	AS	10/07/10 16:47	
EPA 6010B	**Arsenic**	2420	mg/kg	2.5	0.4		W040304	AS	10/07/10 16.46	
EPA 6010B	**Barium**	48 7	mg/kg	0.20	0.02		W040304	AS	10/07/10 16:46	
EPA 6010B	**Cadmium**	2.93	mg/kg	0.20	0.03		W040304	AS	10/07/10 16:46	
EPA 6010B	Chromium	< 0.60	mg/kg	0 60	0.07		W040304	AS	10/07/10 16 47	
EPA 6010B	**Copper**	92 8	mg/kg	1 00	0.21		W040304	AS	10/07/10 16:46	
EPA 6010B	**Iron**	23600	mg/kg	6.0	1 5		W040304	AS	10/07/10 16:45	
EPA 6010B	**Lead**	4370	mg/kg	0.75	0 36		W040304	AS	10/07/10 16 46	
EPA 6010B	**Manganese**	117	mg/kg	0.40	0.09		W040304	AS	10/07/10 16.45	
EPA 6010B	Selenium	< 4 0	mg/kg	4 0	1.0		W040304	AS	10/07/10 16:47	
EPA 6010B	**Silver**	84.7	mg/kg	0.50	0 04		W040304	AS	10/07/10 16 46	
EPA 6010B	**Zinc**	289	mg/kg	1.00	0.22		W040304	AS	10/07/10 16:46	
EPA 7471A	**Mercury**	0 303	mg/kg	0 033	0.010		W040060	JAA	09/30/10 14:22	
Percent Solids										
Percent Solids	**% Solids**	92 0	%	0.1			W041075	DP	10/05/10 10.31	

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: **W0I0613**
Reported: 08-Oct-10 12:03

Client Sample ID: **WFMSSS1**
SVL Sample ID: **W0I0613-16 (Soil)**

Sampled: 16-Sep-10 14:00
Received: 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	11.4	mg/kg	2.0	0.3		W040304	AS	10/07/10 16:31	
EPA 6010B	**Arsenic**	3340	mg/kg	2.5	0.4		W040304	AS	10/07/10 16:31	
EPA 6010B	**Barium**	154	mg/kg	0.20	0.02		W040304	AS	10/07/10 16:31	
EPA 6010B	**Cadmium**	63.4	mg/kg	0.20	0.03		W040304	AS	10/07/10 16:31	
EPA 6010B	**Chromium**	4.16	mg/kg	0.60	0.07		W040304	AS	10/07/10 16:31	
EPA 6010B	**Copper**	172	mg/kg	1.00	0.21		W040304	AS	10/07/10 16:31	
EPA 6010B	**Iron**	38200	mg/kg	6.0	1.5		W040304	AS	10/07/10 16:30	
EPA 6010B	**Lead**	623	mg/kg	0.75	0.36		W040304	AS	10/07/10 16:31	
EPA 6010B	**Manganese**	11200	mg/kg	4.00	0.89	10	W040304	AS	10/07/10 17:06	D2
EPA 6010B	**Selenium**	9.1	mg/kg	4.0	1.0		W040304	AS	10/07/10 16:31	
EPA 6010B	**Silver**	23.5	mg/kg	0.50	0.04		W040304	AS	10/07/10 16:31	
EPA 6010B	**Zinc**	10000	mg/kg	10.0	2.20	10	W040304	AS	10/07/10 17:08	D2
EPA 7471A	**Mercury**	0.785	mg/kg	0.033	0.010		W040060	JAA	09/30/10 14:17	
Percent Solids										
Percent Solids	**% Solids**	92.8	%	0.1			W041075	DP	10/05/10 10:31	

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: **W010613**
Reported: 08-Oct-10 12:03

Client Sample ID: **VWFWD1SS1**
SVL Sample ID: **W010613-15 (Soil)**

Sampled: 16-Sep-10 09:42
Received: 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	6.8	mg/kg	2.0	0.3		W040304	AS	10/07/10 16:26	
EPA 6010B	**Arsenic**	496	mg/kg	2.5	0.4		W040304	AS	10/07/10 16:26	
EPA 6010B	**Barium**	167	mg/kg	0.20	0.02		W040304	AS	10/07/10 16:26	
EPA 6010B	**Cadmium**	0.94	mg/kg	0.20	0.03		W040304	AS	10/07/10 16:26	
EPA 6010B	**Chromium**	0.62	mg/kg	0.60	0.07		W040304	AS	10/07/10 16:26	
EPA 6010B	**Copper**	16.4	mg/kg	1.00	0.21		W040304	AS	10/07/10 16:26	
EPA 6010B	**Iron**	10900	mg/kg	6.0	1.5		W040304	AS	10/07/10 16:24	
EPA 6010B	**Lead**	303	mg/kg	0.75	0.36		W040304	AS	10/07/10 16:26	
EPA 6010B	**Manganese**	109	mg/kg	0.40	0.09		W040304	AS	10/07/10 16:25	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.0		W040304	AS	10/07/10 16:26	
EPA 6010B	**Silver**	15.9	mg/kg	0.50	0.04		W040304	AS	10/07/10 16:26	
EPA 6010B	**Zinc**	112	mg/kg	1.00	0.22		W040304	AS	10/07/10 16:26	
EPA 7471A	**Mercury**	0.190	mg/kg	0.033	0.010		W040060	JAA	09/30/10 14:15	
Percent Solids										
Percent Solids	**% Solids**	95.0	%	0.1			W041075	DP	10/05/10 10:31	

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: **W010613**
Reported: 08-Oct-10 12:03

Client Sample ID: **RBWD1SS1**
SVL Sample ID: **W010613-14 (Soil)**

Sampled: 15-Sep-10 14:00
Received: 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	2.2	mg/kg	2.0	0.3		W040304	AS	10/07/10 16:21	
EPA 6010B	**Arsenic**	344	mg/kg	2.5	0.4		W040304	AS	10/07/10 16:21	
EPA 6010B	**Barium**	189	mg/kg	0.20	0.02		W040304	AS	10/07/10 16:21	
EPA 6010B	**Cadmium**	1.58	mg/kg	0.20	0.03		W040304	AS	10/07/10 16:21	
EPA 6010B	**Chromium**	0.73	mg/kg	0.60	0.07		W040304	AS	10/07/10 16:21	
EPA 6010B	**Copper**	17.2	mg/kg	1.00	0.21		W040304	AS	10/07/10 16:21	
EPA 6010B	**Iron**	12800	mg/kg	6.0	1.5		W040304	AS	10/07/10 16:19	
EPA 6010B	**Lead**	115	mg/kg	0.75	0.36		W040304	AS	10/07/10 16:21	
EPA 6010B	**Manganese**	404	mg/kg	0.40	0.09		W040304	AS	10/07/10 16:19	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.0		W040304	AS	10/07/10 16:21	
EPA 6010B	**Silver**	8.04	mg/kg	0.50	0.04		W040304	AS	10/07/10 16:21	
EPA 6010B	**Zinc**	191	mg/kg	1.00	0.22		W040304	AS	10/07/10 16:21	
EPA 7471A	**Mercury**	0.428	mg/kg	0.033	0.010		W040060	JAA	09/30/10 14:14	
Percent Solids										
Percent Solids	**% Solids**	98.3	%	0.1			W041075	DP	10/05/10 10:31	

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 **W0I0613**
Reported: 08-Oct-10 12 03

Client Sample ID: **VWD2SS1**
SVL Sample ID: **W0I0613-13 (Soil)**

Sampled: 15-Sep-10 13.00
Received: 23-Sep-10
Sampled By BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	29 8	mg/kg	2.0	0.3		W040304	AS	10/07/10 16:15	
EPA 6010B	**Arsenic**	901	mg/kg	2 5	0 4		W040304	AS	10/07/10 16:15	
EPA 6010B	**Barium**	74.1	mg/kg	0 20	0.02		W040304	AS	10/07/10 16:15	
EPA 6010B	**Cadmium**	2 16	mg/kg	0 20	0.03		W040304	AS	10/07/10 16:15	
EPA 6010B	Chromium	< 0 60	mg/kg	0.60	0 07		W040304	AS	10/07/10 16:15	
EPA 6010B	**Copper**	67 2	mg/kg	1.00	0 21		W040304	AS	10/07/10 16 15	
EPA 6010B	**Iron**	11800	mg/kg	6.0	1 5		W040304	AS	10/07/10 16 13	
EPA 6010B	**Lead**	461	mg/kg	0.75	0.36		W040304	AS	10/07/10 16:15	
EPA 6010B	**Manganese**	274	mg/kg	0.40	0 09		W040304	AS	10/07/10 16 14	
EPA 6010B	Selenium	< 4.0	mg/kg	4 0	1.0		W040304	AS	10/07/10 16:15	
EPA 6010B	**Silver**	43.2	mg/kg	0 50	0 04		W040304	AS	10/07/10 16:15	
EPA 6010B	**Zinc**	242	mg/kg	1.00	0.22		W040304	AS	10/07/10 16:15	
EPA 7471A	**Mercury**	0.735	mg/kg	0 033	0.010		W040060	JAA	09/30/10 14 12	
Percent Solids										
Percent Solids	**% Solids**	98.0	%	0.1			W041075	DP	10/05/10 10 31	

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: **W010613**
Reported: 08-Oct-10 12:03

Client Sample ID: **SMCSD1**
SVL Sample ID: **W010613-12 (Soil)**

Sampled: 14-Sep-10 08:05
Received: 23-Sep-10
Sampled By: BS

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		W040304	AS	10/07/10 16:10	
EPA 6010B	**Arsenic**	25 2	mg/kg	2.5	0 4		W040304	AS	10/07/10 16:10	
EPA 6010B	**Barium**	87 9	mg/kg	0 20	0.02		W040304	AS	10/07/10 16:09	
EPA 6010B	**Cadmium**	0.61	mg/kg	0 20	0 03		W040304	AS	10/07/10 16 09	
EPA 6010B	**Chromium**	39 3	mg/kg	0 60	0.07		W040304	AS	10/07/10 16 09	
EPA 6010B	**Copper**	11.8	mg/kg	1 00	0.21		W040304	AS	10/07/10 16 09	
EPA 6010B	**Iron**	19500	mg/kg	6 0	1.5		W040304	AS	10/07/10 16 08	
EPA 6010B	**Lead**	22.6	mg/kg	0 75	0.36		W040304	AS	10/07/10 16:10	
EPA 6010B	**Manganese**	379	mg/kg	0 40	0.09		W040304	AS	10/07/10 16:08	
EPA 6010B	Selenium	< 4.0	mg/kg	4 0	1.0		W040304	AS	10/07/10 16:10	
EPA 6010B	**Silver**	1 17	mg/kg	0.50	0 04		W040304	AS	10/07/10 16:09	
EPA 6010B	**Zinc**	69.3	mg/kg	1 00	0 22		W040304	AS	10/07/10 16:09	
EPA 7471A	**Mercury**	0.210	mg/kg	0 033	0 010		W040060	JAA	09/30/10 14:11	
Percent Solids										
Percent Solids	**% Solids**	96.7	%	0.1			W041075	DP	10/05/10 10 31	

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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: **W0I0613**
Reported: 08-Oct-10 12:03

Client Sample ID: **SMCBG1SD1**
SVL Sample ID: **W0I0613-11 (Soil)**

Sampled: 14-Sep-10 13:58
Received: 23-Sep-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		W040304	AS	10/07/10 16:04	
EPA 6010B	**Arsenic**	3.8	mg/kg	2.5	0.4		W040304	AS	10/07/10 16:04	
EPA 6010B	**Barium**	37.1	mg/kg	0.20	0.02		W040304	AS	10/07/10 16:04	
EPA 6010B	**Cadmium**	0.22	mg/kg	0.20	0.03		W040304	AS	10/07/10 16:04	
EPA 6010B	**Chromium**	1.98	mg/kg	0.60	0.07		W040304	AS	10/07/10 16:04	
EPA 6010B	**Copper**	1.87	mg/kg	1.00	0.21		W040304	AS	10/07/10 16:04	
EPA 6010B	**Iron**	8070	mg/kg	6.0	1.5		W040304	AS	10/07/10 16:03	
EPA 6010B	**Lead**	8.48	mg/kg	0.75	0.36		W040304	AS	10/07/10 16:04	
EPA 6010B	**Manganese**	122	mg/kg	0.40	0.09		W040304	AS	10/07/10 16:03	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.0		W040304	AS	10/07/10 16:04	
EPA 6010B	Silver	< 0.50	mg/kg	0.50	0.04		W040304	AS	10/07/10 16:04	
EPA 6010B	**Zinc**	32.6	mg/kg	1.00	0.22		W040304	AS	10/07/10 16:04	
EPA 7471A	Mercury	< 0.033	mg/kg	0.033	0.010		W040060	JAA	09/30/10 14:09	
Percent Solids										
Percent Solids	**% Solids**	79.5	%	0.1			W041075	DP	10/05/10 10:31	

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 **W0I0613**
Reported: 08-Oct-10 12:03

Client Sample ID: **WMSSS1**
SVL Sample ID: **W0I0613-10 (Soil)**

Sampled: 14-Sep-10 09:00
Received: 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	2.5	mg/kg	2.0	0.3		W040304	AS	10/07/10 15:59	
EPA 6010B	**Arsenic**	44.5	mg/kg	2.5	0.4		W040304	AS	10/07/10 15:59	
EPA 6010B	**Barium**	58.5	mg/kg	0.20	0.02		W040304	AS	10/07/10 15:59	
EPA 6010B	**Cadmium**	0.66	mg/kg	0.20	0.03		W040304	AS	10/07/10 15:59	
EPA 6010B	**Chromium**	3.78	mg/kg	0.60	0.07		W040304	AS	10/07/10 15:59	
EPA 6010B	**Copper**	19.8	mg/kg	1.00	0.21		W040304	AS	10/07/10 15:59	
EPA 6010B	**Iron**	12800	mg/kg	6.0	1.5		W040304	AS	10/07/10 15:57	
EPA 6010B	**Lead**	116	mg/kg	0.75	0.36		W040304	AS	10/07/10 15:59	
EPA 6010B	**Manganese**	332	mg/kg	0.40	0.09		W040304	AS	10/07/10 15:58	
EPA 6010B	**Selenium**	< 4.0	mg/kg	4.0	1.0		W040304	AS	10/07/10 15:59	
EPA 6010B	**Silver**	5.51	mg/kg	0.50	0.04		W040304	AS	10/07/10 15:59	
EPA 6010B	**Zinc**	115	mg/kg	1.00	0.22		W040304	AS	10/07/10 15:59	
EPA 7471A	**Mercury**	33.7	mg/kg	3.30	0.950	100	W040060	JAA	09/30/10 14:46	D2
Percent Solids										
Percent Solids	**% Solids**	96.3	%	0.1			W041075	DP	10/05/10 10:31	

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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: **W0I0613**
Reported: 08-Oct-10 12:03

Client Sample ID: **WFAD1PPE1**
SVL Sample ID: **W0I0613-06 (Soil)**

Sampled: 14-Sep-10 10:50
Received: 23-Sep-10
Sampled By: BS

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		W040304	AS	10/07/10 15:27	
EPA 6010B	**Arsenic**	75.3	mg/kg	2.5	0.4		W040304	AS	10/07/10 15:27	
EPA 6010B	**Barium**	27.5	mg/kg	0.20	0.02		W040304	AS	10/07/10 15:27	
EPA 6010B	**Cadmium**	0.43	mg/kg	0.20	0.03		W040304	AS	10/07/10 15:27	
EPA 6010B	Chromium	< 0.60	mg/kg	0.60	0.07		W040304	AS	10/07/10 15:27	
EPA 6010B	**Copper**	1.93	mg/kg	1.00	0.21		W040304	AS	10/07/10 15:27	
EPA 6010B	**Iron**	5720	mg/kg	6.0	1.5		W040304	AS	10/07/10 15:26	
EPA 6010B	**Lead**	15.6	mg/kg	0.75	0.36		W040304	AS	10/07/10 15:27	
EPA 6010B	**Manganese**	170	mg/kg	0.40	0.09		W040304	AS	10/07/10 15:26	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.0		W040304	AS	10/07/10 15:27	
EPA 6010B	**Silver**	0.81	mg/kg	0.50	0.04		W040304	AS	10/07/10 15:27	
EPA 6010B	**Zinc**	132	mg/kg	1.00	0.22		W040304	AS	10/07/10 15:27	
EPA 7471A	Mercury	< 0.033	mg/kg	0.033	0.010		W040060	JAA	09/30/10 13:53	
Percent Solids										
Percent Solids	**% Solids**	99.1	%	0.1			W041075	DP	10/05/10 10:31	

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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: **W0I0613**
Reported 08-Oct-10 12:03

Client Sample ID: **WMSPPESD1**
SVL Sample ID: **W0I0613-07 (Soil)**

Sampled: 14-Sep-10 08:32
Received: 23-Sep-10
Sampled By BS

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		W040304	AS	10/07/10 15:43	
EPA 6010B	**Arsenic**	7.6	mg/kg	2.5	0.4		W040304	AS	10/07/10 15 43	
EPA 6010B	**Barium**	27 3	mg/kg	0.20	0 02		W040304	AS	10/07/10 15.43	
EPA 6010B	**Cadmium**	0.22	mg/kg	0.20	0.03		W040304	AS	10/07/10 15:43	
EPA 6010B	**Chromium**	2.46	mg/kg	0.60	0.07		W040304	AS	10/07/10 15:43	
EPA 6010B	**Copper**	1 52	mg/kg	1 00	0.21		W040304	AS	10/07/10 15:43	
EPA 6010B	**Iron**	7900	mg/kg	6 0	1 5		W040304	AS	10/07/10 15.41	
EPA 6010B	**Lead**	10 3	mg/kg	0.75	0 36		W040304	AS	10/07/10 15:43	
EPA 6010B	**Manganese**	167	mg/kg	0.40	0.09		W040304	AS	10/07/10 15:42	
EPA 6010B	Selenium	< 4.0	mg/kg	4 0	1.0		W040304	AS	10/07/10 15:43	
EPA 6010B	Silver	< 0.50	mg/kg	0 50	0.04		W040304	AS	10/07/10 15 43	
EPA 6010B	**Zinc**	35.2	mg/kg	1 00	0 22		W040304	AS	10/07/10 15:43	
EPA 7471A	**Mercury**	0.227	mg/kg	0.033	0 010		W040060	JAA	09/30/10 13:58	
Percent Solids										
Percent Solids	**% Solids**	90.9	%	0 1			W041075	DP	10/05/10 10:31	

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: **W0I0613**
Reported: 08-Oct-10 12:03

Client Sample ID: **SMCSD2**
SVL Sample ID: **W0I0613-08 (Soil)**

Sampled: 14-Sep-10 08.15
Received: 23-Sep-10
Sampled By: BS

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		W040304	AS	10/07/10 15:48	
EPA 6010B	**Arsenic**	70.8	mg/kg	2.5	0.4		W040304	AS	10/07/10 15:48	
EPA 6010B	**Barium**	22.3	mg/kg	0.20	0.02		W040304	AS	10/07/10 15:48	
EPA 6010B	**Cadmium**	0 43	mg/kg	0 20	0 03		W040304	AS	10/07/10 15.48	
EPA 6010B	**Chromium**	1 18	mg/kg	0.60	0.07		W040304	AS	10/07/10 15:48	
EPA 6010B	**Copper**	2.29	mg/kg	1 00	0 21		W040304	AS	10/07/10 15.48	
EPA 6010B	**Iron**	6540	mg/kg	6 0	1.5		W040304	AS	10/07/10 15:47	
EPA 6010B	**Lead**	18 0	mg/kg	0.75	0.36		W040304	AS	10/07/10 15:48	
EPA 6010B	**Manganese**	191	mg/kg	0.40	0.09		W040304	AS	10/07/10 15:47	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1 0		W040304	AS	10/07/10 15:48	
EPA 6010B	**Silver**	0 74	mg/kg	0 50	0 04		W040304	AS	10/07/10 15:48	
EPA 6010B	**Zinc**	110	mg/kg	1.00	0.22		W040304	AS	10/07/10 15:48	
EPA 7471A	Mercury	< 0.033	mg/kg	0.033	0 010		W040060	JAA	09/30/10 13:59	
Percent Solids										
Percent Solids	**% Solids**	95.3	%	0.1			W041075	DP	10/05/10 10:31	

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: **W0I0613**
Reported: 08-Oct-10 12 03

Client Sample ID: **WMSSS2**
SVL Sample ID: **W0I0613-09 (Soil)**

Sampled 14-Sep-10 09:10
Received: 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	26 3	mg/kg	2.0	0.3		W040304	AS	10/07/10 15:54	
EPA 6010B	**Arsenic**	300	mg/kg	2 5	0.4		W040304	AS	10/07/10 15 54	
EPA 6010B	**Barium**	549	mg/kg	0 20	0.02		W040304	AS	10/07/10 15:53	
EPA 6010B	**Cadmium**	1 42	mg/kg	0 20	0.03		W040304	AS	10/07/10 15:54	
EPA 6010B	**Chromium**	7 77	mg/kg	0 60	0.07		W040304	AS	10/07/10 15:54	
EPA 6010B	**Copper**	100	mg/kg	1.00	0.21		W040304	AS	10/07/10 15:53	
EPA 6010B	**Iron**	17300	mg/kg	6 0	1.5		W040304	AS	10/07/10 15:52	
EPA 6010B	**Lead**	342	mg/kg	0.75	0.36		W040304	AS	10/07/10 15:54	
EPA 6010B	**Manganese**	3350	mg/kg	0.40	0.09		W040304	AS	10/07/10 15:52	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.0		W040304	AS	10/07/10 15 54	
EPA 6010B	**Silver**	68 5	mg/kg	0.50	0.04		W040304	AS	10/07/10 15 53	
EPA 6010B	**Zinc**	248	mg/kg	1.00	0 22		W040304	AS	10/07/10 15 53	
EPA 7471A	**Mercury**	3.35	mg/kg	0 330	0 095	10	W040060	JAA	09/30/10 14 34	D2
Percent Solids										
Percent Solids	**% Solids**	89.7	%	0.1			W041075	DP	10/05/10 10:31	

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: **W0I0613**
Reported: 08-Oct-10 12.03

Client Sample ID: **SMCBGSS1**
SVL Sample ID: **W0I0613-05 (Soil)**

Sampled: 14-Sep-10 13 55
Received: 23-Sep-10
Sampled By: BS

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		W040304	AS	10/07/10 15:22	
EPA 6010B	**Arsenic**	8.4	mg/kg	2.5	0.4		W040304	AS	10/07/10 15:22	
EPA 6010B	**Barium**	96.5	mg/kg	0.20	0.02		W040304	AS	10/07/10 15:22	
EPA 6010B	**Cadmium**	0.48	mg/kg	0 20	0 03		W040304	AS	10/07/10 15:22	
EPA 6010B	**Chromium**	8 82	mg/kg	0.60	0.07		W040304	AS	10/07/10 15:22	
EPA 6010B	**Copper**	11.2	mg/kg	1.00	0.21		W040304	AS	10/07/10 15:22	
EPA 6010B	**Iron**	15600	mg/kg	6.0	1.5		W040304	AS	10/07/10 15:20	
EPA 6010B	**Lead**	15 9	mg/kg	0 75	0 36		W040304	AS	10/07/10 15:22	
EPA 6010B	**Manganese**	908	mg/kg	0.40	0.09		W040304	AS	10/07/10 15:20	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.0		W040304	AS	10/07/10 15:22	
EPA 6010B	Silver	< 0.50	mg/kg	0.50	0.04		W040304	AS	10/07/10 15:22	
EPA 6010B	**Zinc**	70.8	mg/kg	1.00	0.22		W040304	AS	10/07/10 15:22	
EPA 7471A	Mercury	< 0 033	mg/kg	0 033	0 010		W040060	JAA	09/30/10 13:51	
Percent Solids										
Percent Solids	**% Solids**	92.9	%	0.1			W041075	DP	10/05/10 10:31	

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: **W0I0613**
Reported: 08-Oct-10 12 03

Client Sample ID: **SMADSS1**
SVL Sample ID: **W0I0613-04 (Soil)**

Sampled: 14-Sep-10 14 00
Received: 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	61 8	mg/kg	2.0	0.3		W040304	AS	10/07/10 15:17	
EPA 6010B	**Arsenic**	285	mg/kg	2 5	0.4		W040304	AS	10/07/10 15.17	
EPA 6010B	**Barium**	106	mg/kg	0 20	0 02		W040304	AS	10/07/10 15:16	
EPA 6010B	**Cadmium**	15.8	mg/kg	0.20	0.03		W040304	AS	10/07/10 15 16	
EPA 6010B	Chromium	< 0 60	mg/kg	0.60	0.07		W040304	AS	10/07/10 15:17	
EPA 6010B	**Copper**	10.2	mg/kg	1 00	0 21		W040304	AS	10/07/10 15 16	
EPA 6010B	**Iron**	6560	mg/kg	6 0	1 5		W040304	AS	10/07/10 15:15	
EPA 6010B	**Lead**	435	mg/kg	0.75	0.36		W040304	AS	10/07/10 15.16	
EPA 6010B	**Manganese**	44.0	mg/kg	0.40	0.09		W040304	AS	10/07/10 15:15	
EPA 6010B	Selenium	< 4 0	mg/kg	4.0	1.0		W040304	AS	10/07/10 15 17	
EPA 6010B	**Silver**	48.1	mg/kg	0.50	0 04		W040304	AS	10/07/10 15:16	
EPA 6010B	**Zinc**	3840	mg/kg	1 00	0.22		W040304	AS	10/07/10 15:16	
EPA 7471A	**Mercury**	0.670	mg/kg	0.033	0.010		W040060	JAA	09/30/10 13:50	
Percent Solids										
Percent Solids	**% Solids**	97 4	%	0.1			W041075	DP	10/05/10 10:31	

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

John Kern
Laboratory Director

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

Project Name: Boise
Work Order: **W0I0613**
Reported: 08-Oct-10 12:03

Client Sample ID: **WFWD1MT1**
SVL Sample ID: **W0I0613-03 (Soil)**

Sampled: 14-Sep-10 11:00
Received: 23-Sep-10
Sampled By: BS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	**Antimony**	34 3	mg/kg	2 0	0.3		W040304	AS	10/07/10 15:11	
EPA 6010B	**Arsenic**	1430	mg/kg	2 5	0.4		W040304	AS	10/07/10 15:11	
EPA 6010B	**Barium**	20.9	mg/kg	0 20	0.02		W040304	AS	10/07/10 15:11	
EPA 6010B	**Cadmium**	11.0	mg/kg	0 20	0 03		W040304	AS	10/07/10 15:11	
EPA 6010B	**Chromium**	1.77	mg/kg	0.60	0.07		W040304	AS	10/07/10 15:11	
EPA 6010B	**Copper**	22 9	mg/kg	1.00	0.21		W040304	AS	10/07/10 15:11	
EPA 6010B	**Iron**	8470	mg/kg	6.0	1 5		W040304	AS	10/07/10 15:09	
EPA 6010B	**Lead**	492	mg/kg	0.75	0.36		W040304	AS	10/07/10 15:11	
EPA 6010B	**Manganese**	755	mg/kg	0.40	0.09		W040304	AS	10/07/10 15:09	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.0		W040304	AS	10/07/10 15:11	
EPA 6010B	**Silver**	36.5	mg/kg	0.50	0.04		W040304	AS	10/07/10 15:11	
EPA 6010B	**Zinc**	1050	mg/kg	1.00	0.22		W040304	AS	10/07/10 15:11	
EPA 7471A	**Mercury**	0.792	mg/kg	0.033	0.010		W040060	JAA	09/30/10 13 48	
Percent Solids										
Percent Solids	**% Solids**	92.6	%	0.1			W041075	DP	10/05/10 10:31	

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

John Kern
Laboratory Director

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IDEQ (Boise)
1410 N Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0I0613**
Reported: 08-Oct-10 12:03

Client Sample ID: **UKAD1SS1**
SVL Sample ID: **W0I0613-02 (Soil)**

Sampled: 14-Sep-10 15:50
Received: 23-Sep-10
Sampled By: BS

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		W040304	AS	10/07/10 15:06	
EPA 6010B	**Arsenic**	326	mg/kg	2.5	0.4		W040304	AS	10/07/10 15.06	
EPA 6010B	**Barium**	47 5	mg/kg	0.20	0.02		W040304	AS	10/07/10 15:05	
EPA 6010B	**Cadmium**	1.36	mg/kg	0.20	0.03		W040304	AS	10/07/10 15:05	
EPA 6010B	**Chromium**	0 85	mg/kg	0.60	0.07		W040304	AS	10/07/10 15:06	
EPA 6010B	**Copper**	10.7	mg/kg	1 00	0.21		W040304	AS	10/07/10 15 05	
EPA 6010B	**Iron**	13700	mg/kg	6.0	1 5		W040304	AS	10/07/10 15:04	
EPA 6010B	**Lead**	399	mg/kg	0 75	0 36		W040304	AS	10/07/10 15 05	
EPA 6010B	**Manganese**	548	mg/kg	0 40	0.09		W040304	AS	10/07/10 15 04	
EPA 6010B	Selenium	< 4.0	mg/kg	4 0	1.0		W040304	AS	10/07/10 15:06	
EPA 6010B	**Silver**	0.98	mg/kg	0.50	0.04		W040304	AS	10/07/10 15:05	
EPA 6010B	**Zinc**	195	mg/kg	1.00	0 22		W040304	AS	10/07/10 15:05	
EPA 7471A	**Mercury**	0.133	mg/kg	0 033	0 010		W040060	JAA	09/30/10 13:47	
Percent Solids										
Percent Solids	**% Solids**	94.5	%	0.1			W041075	DP	10/05/10 10:31	

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: **W0I0613**
Reported: 08-Oct-10 12:03

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods								
EPA 6010B	Antimony	mg/kg	<2.0	0.3	2.0	W040304	07-Oct-10	
EPA 6010B	Arsenic	mg/kg	<2.5	0.4	2.5	W040304	07-Oct-10	
EPA 6010B	Barium	mg/kg	<0.20	0.02	0.20	W040304	07-Oct-10	
EPA 6010B	Cadmium	mg/kg	<0.20	0.03	0.20	W040304	07-Oct-10	
EPA 6010B	Chromium	mg/kg	<0.60	0.07	0.60	W040304	07-Oct-10	
EPA 6010B	Copper	mg/kg	<1.00	0.21	1.00	W040304	07-Oct-10	
EPA 6010B	Iron	mg/kg	<6.0	1.5	6.0	W040304	07-Oct-10	
EPA 6010B	Lead	mg/kg	<0.75	0.36	0.75	W040304	07-Oct-10	
EPA 6010B	Manganese	mg/kg	<0.40	0.09	0.40	W040304	07-Oct-10	
EPA 6010B	Selenium	mg/kg	<4.0	1.0	4.0	W040304	07-Oct-10	
EPA 6010B	Silver	mg/kg	<0.50	0.04	0.50	W040304	07-Oct-10	
EPA 6010B	Zinc	mg/kg	<1.00	0.22	1.00	W040304	07-Oct-10	
EPA 7471A	Mercury	mg/kg	<0.033	0.010	0.033	W040060	30-Sep-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods									
EPA 6010B	Antimony	mg/kg	90.4	100	90.4	80 - 120	W040304	07-Oct-10	
EPA 6010B	Arsenic	mg/kg	89.6	100	89.6	80 - 120	W040304	07-Oct-10	
EPA 6010B	Barium	mg/kg	96.8	100	96.8	80 - 120	W040304	07-Oct-10	
EPA 6010B	Cadmium	mg/kg	91.3	100	91.3	80 - 120	W040304	07-Oct-10	
EPA 6010B	Chromium	mg/kg	95.2	100	95.2	80 - 120	W040304	07-Oct-10	
EPA 6010B	Copper	mg/kg	94.3	100	94.3	80 - 120	W040304	07-Oct-10	
EPA 6010B	Iron	mg/kg	895	1000	89.5	80 - 120	W040304	07-Oct-10	
EPA 6010B	Lead	mg/kg	92.7	100	92.7	80 - 120	W040304	07-Oct-10	
EPA 6010B	Manganese	mg/kg	94.1	100	94.1	80 - 120	W040304	07-Oct-10	
EPA 6010B	Selenium	mg/kg	82.5	100	82.5	80 - 120	W040304	07-Oct-10	
EPA 6010B	Silver	mg/kg	4.68	5.00	93.6	80 - 120	W040304	07-Oct-10	
EPA 6010B	Zinc	mg/kg	90.1	100	90.1	80 - 120	W040304	07-Oct-10	
EPA 7471A	Mercury	mg/kg	0.848	0.833	102	80 - 120	W040060	30-Sep-10	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	mg/kg	51.8	<2.0	100	50.9	75 - 125	W040304	07-Oct-10	M2
EPA 6010B	Arsenic	mg/kg	151	50.8	100	100	75 - 125	W040304	07-Oct-10	
EPA 6010B	Barium	mg/kg	213	126	100	86.7	75 - 125	W040304	07-Oct-10	
EPA 6010B	Cadmium	mg/kg	91.6	0.58	100	91.0	75 - 125	W040304	07-Oct-10	
EPA 6010B	Chromium	mg/kg	99.0	2.90	100	96.1	75 - 125	W040304	07-Oct-10	
EPA 6010B	Copper	mg/kg	116	15.2	100	101	75 - 125	W040304	07-Oct-10	
EPA 6010B	Iron	mg/kg	12500	12200	1000	R > 4S	75 - 125	W040304	07-Oct-10	M3
EPA 6010B	Lead	mg/kg	135	37.2	100	98.3	75 - 125	W040304	07-Oct-10	
EPA 6010B	Manganese	mg/kg	613	540	100	R > 4S	75 - 125	W040304	07-Oct-10	M3
EPA 6010B	Selenium	mg/kg	84.9	<4.0	100	84.9	75 - 125	W040304	07-Oct-10	
EPA 6010B	Silver	mg/kg	17.3	9.58	5.00	155	75 - 125	W040304	07-Oct-10	M1
EPA 6010B	Zinc	mg/kg	172	81.0	100	91.1	75 - 125	W040304	07-Oct-10	
EPA 7471A	Mercury	mg/kg	0.295	0.125	0.167	102	75 - 125	W040060	30-Sep-10	

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IDEQ (Boise)
1410 N Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0I0613**
Reported: 08-Oct-10 12.03

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	mg/kg	45.6	51.8	100	12.9	20	W040304	07-Oct-10	
EPA 6010B	Arsenic	mg/kg	139	151	100	8.4	20	W040304	07-Oct-10	
EPA 6010B	Barium	mg/kg	248	213	100	15.2	20	W040304	07-Oct-10	
EPA 6010B	Cadmium	mg/kg	91.8	91.6	100	0 2	20	W040304	07-Oct-10	
EPA 6010B	Chromium	mg/kg	99 3	99 0	100	0 3	20	W040304	07-Oct-10	
EPA 6010B	Copper	mg/kg	114	116	100	2 1	20	W040304	07-Oct-10	
EPA 6010B	Iron	mg/kg	13400	12500	1000	7.1	20	W040304	07-Oct-10	
EPA 6010B	Lead	mg/kg	127	135	100	6.5	20	W040304	07-Oct-10	
EPA 6010B	Manganese	mg/kg	629	613	100	2.6	20	W040304	07-Oct-10	
EPA 6010B	Selenium	mg/kg	84.9	84.9	100	0 1	20	W040304	07-Oct-10	
EPA 6010B	Silver	mg/kg	11 3	17.3	5 00	41.8	20	W040304	07-Oct-10	R1
EPA 6010B	Zinc	mg/kg	167	172	100	2.8	20	W040304	07-Oct-10	
EPA 7471A	Mercury	mg/kg	0 305	0 295	0 167	3 3	20	W040060	30-Sep-10	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	mg/kg	90 2	<2.0	100	89.3	75 - 125	W040304	07-Oct-10	
EPA 6010B	Silver	mg/kg	14 2	9 58	5 00	92.1	75 - 125	W040304	07-Oct-10	

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was aeceptable.
M3	The spike reeovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable
R1	RPD exeeeded the method acceptanee limit
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Differenee
UDL	A result is less than the detection limit
R > 4S	% reeovery 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

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

Project Name: Boise
Work Order: **W0I0613**
Reported: 08-Oct-10 12:03

Client Sample ID: **COWDSS1**
SVL Sample ID: **W0I0613-01 (Soil)**

Sampled: 14-Sep-10 13:20
Received: 23-Sep-10
Sampled By: BS

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		W040304	AS	10/07/10 14:50	
EPA 6010B	**Arsenic**	50.8	mg/kg	2.5	0.4		W040304	AS	10/07/10 14:50	
EPA 6010B	**Barium**	126	mg/kg	0.20	0.02		W040304	AS	10/07/10 14:50	
EPA 6010B	**Cadmium**	0.58	mg/kg	0.20	0.03		W040304	AS	10/07/10 14:50	
EPA 6010B	**Chromium**	2.90	mg/kg	0.60	0.07		W040304	AS	10/07/10 14:50	
EPA 6010B	**Copper**	15.2	mg/kg	1.00	0.21		W040304	AS	10/07/10 14:50	
EPA 6010B	**Iron**	12200	mg/kg	6.0	1.5		W040304	AS	10/07/10 14:48	
EPA 6010B	**Lead**	37.2	mg/kg	0.75	0.36		W040304	AS	10/07/10 14:50	
EPA 6010B	**Manganese**	540	mg/kg	0.40	0.09		W040304	AS	10/07/10 14:48	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.0		W040304	AS	10/07/10 14:50	
EPA 6010B	**Silver**	9.58	mg/kg	0.50	0.04		W040304	AS	10/07/10 14:50	
EPA 6010B	**Zinc**	81.0	mg/kg	1.00	0.22		W040304	AS	10/07/10 14:50	
EPA 7471A	**Mercury**	0.125	mg/kg	0.033	0.010		W040060	JAA	09/30/10 13:42	
Percent Solids										
Percent Solids	**% Solids**	94.9	%	0.1			W041075	DP	10/05/10 10:31	

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: **W0I0613**
Reported: 08-Oct-10 12:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
COWDSS1	W0I0613-01	Soil	14-Sep-10 13:20	BS	23-Sep-2010
UKAD1SS1	W0I0613-02	Soil	14-Sep-10 15:50	BS	23-Sep-2010
WFWD1MT1	W0I0613-03	Soil	14-Sep-10 11:00	BS	23-Sep-2010
SMADSS1	W0I0613-04	Soil	14-Sep-10 14:00	BS	23-Sep-2010
SMCBGSS1	W0I0613-05	Soil	14-Sep-10 13:55	BS	23-Sep-2010
WFAD1PPE1	W0I0613-06	Soil	14-Sep-10 10:50	BS	23-Sep-2010
WMSPPESD1	W0I0613-07	Soil	14-Sep-10 08:32	BS	23-Sep-2010
SMCSD2	W0I0613-08	Soil	14-Sep-10 08:15	BS	23-Sep-2010
WMSSS2	W0I0613-09	Soil	14-Sep-10 09:10	BS	23-Sep-2010
WMSSS1	W0I0613-10	Soil	14-Sep-10 09:00	BS	23-Sep-2010
SMCBG1SD1	W0I0613-11	Soil	14-Sep-10 13:58	TE	23-Sep-2010
SMCSD1	W0I0613-12	Soil	14-Sep-10 08:05	BS	23-Sep-2010
VWD2SS1	W0I0613-13	Soil	15-Sep-10 13:00	BS	23-Sep-2010
RBWD1SS1	W0I0613-14	Soil	15-Sep-10 14:00	BS	23-Sep-2010
VWFWD1SS1	W0I0613-15	Soil	16-Sep-10 09:42	BS	23-Sep-2010
WFMSSS1	W0I0613-16	Soil	16-Sep-10 14:00	BS	23-Sep-2010
WF600LVSS1	W0I0613-17	Soil	16-Sep-10 13:40	BS	23-Sep-2010
WF400LVSS1	W0I0613-18	Soil	16-Sep-10 10:40	BS	23-Sep-2010
WF300WDSS1	W0I0613-19	Soil	16-Sep-10 10:22	BS	23-Sep-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.

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

Project Name: Boise
Work Order: **W0I0611**
Reported: 07-Oct-10 15:30

Client Sample ID: **SMCBG1SW1**
SVL Sample ID: **W0I0611-01 (Surface Water)**

Sampled: 14-Sep-10 13:58
Received: 23-Sep-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		W040059	JAA	09/30/10 11:00	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 11:27	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W039346	DT	10/07/10 11:27	
EPA 6010B	**Barium**	0.0028	mg/L	0.0020	0.0005		W039346	DT	10/07/10 11:27	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 11:27	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 11:27	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 11:27	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W039346	DT	10/07/10 11:26	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 11:27	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0017		W039346	DT	10/07/10 11:26	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 11:27	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 11:27	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W039346	DT	10/07/10 11:27	

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

Nan Wilson
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: **W0I0611**
Reported: 07-Oct-10 15:30

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
SMCBG1SW1	W0I0611-01	Surface Water	14-Sep-10 13:58	TE	23-Sep-2010
WMSPPE1	W0I0611-02	Surface Water	14-Sep-10 08:30	BG	23-Sep-2010
SMCSW3	W0I0611-03	Surface Water	14-Sep-10 11:54	BG	23-Sep-2010
SMCSW2	W0I0611-04	Surface Water	14-Sep-10 08:15	TE	23-Sep-2010
WFAD1PPE1SW1	W0I0611-05	Surface Water	14-Sep-10 10:49	TE	23-Sep-2010
COAD1SW1	W0I0611-06	Surface Water	14-Sep-10 13:29	TE	23-Sep-2010
WFWD2SW1	W0I0611-07	Surface Water	14-Sep-10 11:35	TE	23-Sep-2010
UKAD1SW1	W0I0611-08	Surface Water	14-Sep-10 15.54	TE	23-Sep-2010
SMCSW1	W0I0611-09	Surface Water	14-Sep-10 08:00	BS	23-Sep-2010
NTSW1	W0I0611-10	Surfaee Water	14-Sep-10 12:40	TE	23-Sep-2010
SMCSW4	W0I0611-11	Surfaee Water	14-Sep-10 12:19	BS	23-Sep-2010
NTWDSW1	W0I0611-12	Surface Water	14-Sep-10 12:58	BS	23-Sep-2010
WF600LVSW1	W0I0611-13	Surfaee Water	16-Sep-10 13.30	TE	23-Sep-2010
WF400LVSW1	W0I0611-14	Surfaee Water	16-Sep-10 11.04	BS	23-Sep-2010

Solid samples are analyzed on an as-reeeived, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supereedes 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 iu this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

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

Project Name: Boise
Work Order: **W010611**
Reported: 07-Oct-10 15:30

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total Recoverable) (Continued)										
EPA 6010B	Lead	mg/L	1.01	<0.0075	1.00	101	75 - 125	W039346	07-Oct-10	
EPA 6010B	Manganese	mg/L	1.05	<0.0040	1.00	105	75 - 125	W039346	07-Oct-10	
EPA 6010B	Selenium	mg/L	0.998	<0.040	1.00	99.8	75 - 125	W039346	07-Oct-10	
EPA 6010B	Silver	mg/L	0.0524	<0.0050	0.0500	105	75 - 125	W039346	07-Oct-10	
EPA 6010B	Zinc	mg/L	0.984	<0.0100	1.00	98.1	75 - 125	W039346	07-Oct-10	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	mg/L	0.00086	0.00088	0.00100	2.3	20	W040059	30-Sep-10	
Metals (Total Recoverable)										
EPA 6010B	Antimony	mg/L	0.997	0.991	1.00	0.5	20	W039346	07-Oct-10	
EPA 6010B	Arsenic	mg/L	0.946	0.937	1.00	1.0	20	W039346	07-Oct-10	
EPA 6010B	Barium	mg/L	1.05	1.05	1.00	0.0	20	W039346	07-Oct-10	
EPA 6010B	Cadmium	mg/L	1.04	1.04	1.00	0.4	20	W039346	07-Oct-10	
EPA 6010B	Chromium	mg/L	1.02	1.02	1.00	0.0	20	W039346	07-Oct-10	
EPA 6010B	Copper	mg/L	0.947	0.938	1.00	0.9	20	W039346	07-Oct-10	
EPA 6010B	Iron	mg/L	9.59	9.66	10.0	0.8	20	W039346	07-Oct-10	
EPA 6010B	Lead	mg/L	1.01	1.01	1.00	0.1	20	W039346	07-Oct-10	
EPA 6010B	Manganese	mg/L	1.04	1.05	1.00	0.7	20	W039346	07-Oct-10	
EPA 6010B	Selenium	mg/L	1.00	0.998	1.00	0.1	20	W039346	07-Oct-10	
EPA 6010B	Silver	mg/L	0.0525	0.0524	0.0500	0.2	20	W039346	07-Oct-10	
EPA 6010B	Zinc	mg/L	0.981	0.984	1.00	0.3	20	W039346	07-Oct-10	

Notes and Definitions

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

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IDEQ (Boise)
1410 N Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0I0611**
Reported: 07-Oct-10 15 30

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 7470A	Mercury	mg/L	<0 00020	0,000065	0.00020	W040059	30-Sep-10	
Metals (Total Recoverable)								
EPA 6010B	Antimony	mg/L	<0.020	0.004	0.020	W039346	07-Oct-10	
EPA 6010B	Arsenic	mg/L	<0.025	0.006	0.025	W039346	07-Oct-10	
EPA 6010B	Barium	mg/L	<0.0020	0.0005	0.0020	W039346	07-Oct-10	
EPA 6010B	Cadmium	mg/L	<0 0020	0.0005	0.0020	W039346	07-Oct-10	
EPA 6010B	Chromium	mg/L	<0.0060	0.0009	0.0060	W039346	07-Oct-10	
EPA 6010B	Copper	mg/L	<0.010	0.005	0.010	W039346	07-Oct-10	
EPA 6010B	Iron	mg/L	<0 060	0 027	0.060	W039346	07-Oct-10	
EPA 6010B	Lead	mg/L	<0.0075	0.0040	0.0075	W039346	07-Oct-10	
EPA 6010B	Manganese	mg/L	<0.0040	0.0017	0 0040	W039346	07-Oct-10	
EPA 6010B	Selenium	mg/L	<0 040	0.013	0.040	W039346	07-Oct-10	
EPA 6010B	Silver	mg/L	<0.0050	0.0014	0.0050	W039346	07-Oct-10	
EPA 6010B	Zinc	mg/L	<0.0100	0.0019	0.0100	W039346	07-Oct-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 7470A	Mercury	mg/L	0.00476	0.00500	95 2	80 - 120	W040059	30-Sep-10	
Metals (Total Recoverable)									
EPA 6010B	Antimony	mg/L	1.01	1 00	101	80 - 120	W039346	07-Oct-10	
EPA 6010B	Arsenic	mg/L	0 962	1.00	96.2	80 - 120	W039346	07-Oct-10	
EPA 6010B	Barium	mg/L	1 07	1.00	107	80 - 120	W039346	07-Oct-10	
EPA 6010B	Cadmium	mg/L	1.06	1 00	106	80 - 120	W039346	07-Oct-10	
EPA 6010B	Chromium	mg/L	1.04	1 00	104	80 - 120	W039346	07-Oct-10	
EPA 6010B	Copper	mg/L	0 956	1.00	95.6	80 - 120	W039346	07-Oct-10	
EPA 6010B	Iron	mg/L	9.56	10 0	95.6	80 - 120	W039346	07-Oct-10	
EPA 6010B	Lead	mg/L	1 03	1.00	103	80 - 120	W039346	07-Oct-10	
EPA 6010B	Manganese	mg/L	1 04	1 00	104	80 - 120	W039346	07-Oct-10	
EPA 6010B	Selenium	mg/L	1.02	1 00	102	80 - 120	W039346	07-Oct-10	
EPA 6010B	Silver	mg/L	0.0532	0.0500	106	80 - 120	W039346	07-Oct-10	
EPA 6010B	Zinc	mg/L	1.00	1.00	100	80 - 120	W039346	07-Oct-10	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	mg/L	0.00088	<0.00020	0 00100	88.0	75 - 125	W040059	30-Sep-10	
Metals (Total Recoverable)										
EPA 6010B	Antimony	mg/L	0.991	<0.020	1 00	99.1	75 - 125	W039346	07-Oct-10	
EPA 6010B	Arsenic	mg/L	0 937	<0 025	1 00	93.7	75 - 125	W039346	07-Oct-10	
EPA 6010B	Barium	mg/L	1.05	0 0028	1.00	105	75 - 125	W039346	07-Oct-10	
EPA 6010B	Cadmium	mg/L	1 04	<0.0020	1.00	104	75 - 125	W039346	07-Oct-10	
EPA 6010B	Chromium	mg/L	1.02	<0.0060	1 00	102	75 - 125	W039346	07-Oct-10	
EPA 6010B	Copper	mg/L	0 938	<0 010	1.00	93 8	75 - 125	W039346	07-Oct-10	
EPA 6010B	Iron	mg/L	9.66	<0 060	10 0	96.6	75 - 125	W039346	07-Oct-10	

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IDEQ (Boise)
1410 N Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0I0611**
Reported 07-Oct-10 15:30

Client Sample ID: **WF400LVSW1**
SVL Sample ID: **W0I0611-14 (Surface Water)**

Sampled: 16-Sep-10 11:04
Received: 23-Sep-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		W040059	JAA	09/30/10 11:24	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 13:01	
EPA 6010B	**Arsenic**	0.159	mg/L	0.025	0.006		W039346	DT	10/07/10 13:01	
EPA 6010B	**Barium**	0.0051	mg/L	0.0020	0.0005		W039346	DT	10/07/10 13:01	
EPA 6010B	**Cadmium**	0.0032	mg/L	0.0020	0.0005		W039346	DT	10/07/10 14:42	
EPA 6010B	**Chromium**	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 13:01	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 13:01	
EPA 6010B	**Iron**	1.01	mg/L	0.060	0.027		W039346	DT	10/07/10 13:00	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 13:01	
EPA 6010B	**Manganese**	0.654	mg/L	0.0040	0.0017		W039346	DT	10/07/10 13:00	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 13:01	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 13:01	
EPA 6010B	**Zinc**	0.646	mg/L	0.0100	0.0019		W039346	DT	10/07/10 13:01	

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

Nan Wilson
Laboratory Director

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IDEQ (Boise)
1410 N Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0I0611**
Reported: 07-Oct-10 15:30

Client Sample ID: **WF600LVSW1**
SVL Sample ID: **W0I0611-13 (Surface Water)**

Sampled: 16-Sep-10 13:30
Received: 23-Sep-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		W040059	JAA	09/30/10 11:23	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 12:55	
EPA 6010B	**Arsenic**	0.219	mg/L	0.025	0.006		W039346	DT	10/07/10 12:55	
EPA 6010B	**Barium**	0.0055	mg/L	0.0020	0.0005		W039346	DT	10/07/10 12:55	
EPA 6010B	**Cadmium**	0.0024	mg/L	0.0020	0.0005		W039346	DT	10/07/10 14:36	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 12:55	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 12:55	
EPA 6010B	**Iron**	0.566	mg/L	0.060	0.027		W039346	DT	10/07/10 12:54	
EPA 6010B	**Lead**	0.0085	mg/L	0.0075	0.0040		W039346	DT	10/07/10 12:55	
EPA 6010B	**Manganese**	0.318	mg/L	0.0040	0.0017		W039346	DT	10/07/10 12:54	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 12:55	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 12:55	
EPA 6010B	**Zinc**	0.542	mg/L	0.0100	0.0019		W039346	DT	10/07/10 12:55	

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Nan Wilson
Laboratory Director

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IDEQ (Boise)
1410 N Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0I0611**
Reported 07-Oct-10 15:30

Client Sample ID: **NTWDSW1**
SVL Sample ID: **W0I0611-12 (Surface Water)**

Sampled 14-Sep-10 12 58
Received: 23-Sep-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		W040059	JAA	09/30/10 11:21	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0 004		W039346	DT	10/07/10 12:50	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W039346	DT	10/07/10 12:50	
EPA 6010B	**Barium**	0 0219	mg/L	0 0020	0.0005		W039346	DT	10/07/10 12 50	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0 0005		W039346	DT	10/07/10 14.30	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0 0009		W039346	DT	10/07/10 12:50	
EPA 6010B	Copper	< 0 010	mg/L	0 010	0.005		W039346	DT	10/07/10 12:49	
EPA 6010B	**Iron**	0 577	mg/L	0.060	0 027		W039346	DT	10/07/10 12:48	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 12 50	
EPA 6010B	**Manganese**	0 0425	mg/L	0 0040	0.0017		W039346	DT	10/07/10 12:48	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 12:50	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0 0014		W039346	DT	10/07/10 12 49	
EPA 6010B	**Zinc**	0.0173	mg/L	0.0100	0.0019		W039346	DT	10/07/10 12:50	

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Laboratory Director

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

Project Name: Boise
Work Order **W0I0611**
Reported: 07-Oct-10 15 30

Client Sample ID: **SMCSW4**
SVL Sample ID: **W0I0611-11 (Surface Water)**

Sampled: 14-Sep-10 12:19
Received: 23-Sep-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		W040059	JAA	09/30/10 11:19	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0 020	0 004		W039346	DT	10/07/10 12 44	
EPA 6010B	Arsenic	< 0.025	mg/L	0 025	0 006		W039346	DT	10/07/10 12 44	
EPA 6010B	**Barium**	0.0035	mg/L	0.0020	0 0005		W039346	DT	10/07/10 12:44	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 14.25	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0 0009		W039346	DT	10/07/10 12:44	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0 005		W039346	DT	10/07/10 12:44	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0 027		W039346	DT	10/07/10 12:43	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 12:44	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0017		W039346	DT	10/07/10 12:43	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 12:44	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 12:44	
EPA 6010B	**Zinc**	0 0100	mg/L	0.0100	0.0019		W039346	DT	10/07/10 12:44	

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

Nan Wilson
Laboratory Director

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

Project Name: Boise
Work Order **W0I0611**
Reported: 07-Oct-10 15:30

Client Sample ID: **NTSW1**
SVL Sample ID: **W0I0611-10 (Surface Water)**

Sampled: 14-Sep-10 12:40
Received: 23-Sep-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		W040059	JAA	09/30/10 11:14	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 12:39	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W039346	DT	10/07/10 12:39	
EPA 6010B	**Barium**	0.0023	mg/L	0.0020	0.0005		W039346	DT	10/07/10 12:39	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 14:19	
EPA 6010B	**Chromium**	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 12:39	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 12:38	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W039346	DT	10/07/10 12:37	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 12:39	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0017		W039346	DT	10/07/10 12:37	
EPA 6010B	**Selenium**	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 12:39	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 12:38	
EPA 6010B	**Zinc**	0.0177	mg/L	0.0100	0.0019		W039346	DT	10/07/10 12:39	

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

Nan Wilson
Laboratory Director

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

Project Name: Boise
Work Order: **W0I0611**
Reported: 07-Oct-10 15:30

Client Sample ID: **SMCSW1**
SVL Sample ID: **W0I0611-09 (Surface Water)**

Sampled: 14-Sep-10 08:00
Received: 23-Sep-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		W040059	JAA	09/30/10 11:13	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 12:33	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W039346	DT	10/07/10 12:33	
EPA 6010B	**Barium**	0.0043	mg/L	0.0020	0.0005		W039346	DT	10/07/10 12:33	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 14:13	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 12:33	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 12:33	
EPA 6010B	**Iron**	0.079	mg/L	0.060	0.027		W039346	DT	10/07/10 12:32	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 12:33	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0017		W039346	DT	10/07/10 12:32	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 12:33	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 12:33	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W039346	DT	10/07/10 12:33	

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

Nan Wilson
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: **W0I0611**
Reported 07-Oct-10 15:30

Client Sample ID: **UKAD1SW1**
SVL Sample ID: **W0I0611-08 (Surface Water)**

Sampled: 14-Sep-10 15:54
Received: 23-Sep-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		W040859	JAA	09/30/10 11:11	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 12:28	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W039346	DT	10/07/10 12:28	
EPA 6010B	**Barium**	0.0038	mg/L	0.0020	0.0005		W039346	DT	10/07/10 12:28	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 14:08	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 12:28	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 12:27	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W039346	DT	10/07/10 12:26	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 12:28	
EPA 6010B	**Manganese**	0.0068	mg/L	0.0040	0.0017		W039346	DT	10/07/10 12:26	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 12:28	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 12:27	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W039346	DT	10/07/10 12:28	

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Laboratory Director

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

Project Name: Boise
Work Order: **W0I0611**
Reported: 07-Oct-10 15:30

Client Sample ID: **WFWD2SW1**
SVL Sample ID: **W0I0611-07 (Surface Water)**

Sampled 14-Sep-10 11:35
Received: 23-Sep-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		W040059	JAA	09/30/10 11:10	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 12:22	
EPA 6010B	**Arsenic**	0.084	mg/L	0.025	0.006		W039346	DT	10/07/10 12:22	
EPA 6010B	**Barium**	0.0062	mg/L	0.0020	0.0005		W039346	DT	10/07/10 12:22	
EPA 6010B	**Cadmium**	0.0022	mg/L	0.0020	0.0005		W039346	DT	10/07/10 14:02	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 12:22	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 12:22	
EPA 6010B	**Iron**	0.481	mg/L	0.060	0.027		W039346	DT	10/07/10 12:21	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 12:22	
EPA 6010B	**Manganese**	0.246	mg/L	0.0040	0.0017		W039346	DT	10/07/10 12:21	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 12:22	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 12:22	
EPA 6010B	**Zinc**	0.397	mg/L	0.0100	0.0019		W039346	DT	10/07/10 12:22	

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Laboratory Director

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IDEQ (Boise)
1410 N Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0I0611**
Reported: 07-Oct-10 15:30

Client Sample ID: **COAD1SW1**
SVL Sample ID: **W0I0611-06 (Surface Water)**

Sampled: 14-Sep-10 13:29
Received: 23-Sep-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		W040059	JAA	09/30/10 11:08	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 12:06	
EPA 6010B	Arsenic	0.047	mg/L	0.025	0.006		W039346	DT	10/07/10 12:06	
EPA 6010B	Barium	0.0024	mg/L	0.0020	0.0005		W039346	DT	10/07/10 12:06	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 12:06	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 12:06	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 12:06	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W039346	DT	10/07/10 12:05	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 12:06	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0017		W039346	DT	10/07/10 12:05	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 12:06	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 12:06	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W039346	DT	10/07/10 12:06	

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

Project Name: Boise
Work Order: **W0I0611**
Reported: 07-Oct-10 15:30

Client Sample ID: **WFAD1PPE1SW1**
SVL Sample ID: **W0I0611-05 (Surface Water)**

Sampled 14-Sep-10 10:49
Received: 23-Sep-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		W040059	JAA	09/30/10 11:06	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 12:01	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W039346	DT	10/07/10 12:01	
EPA 6010B	**Barium**	0.0098	mg/L	0.0020	0.0005		W039346	DT	10/07/10 12:01	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 12:01	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 12:01	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 12:00	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W039346	DT	10/07/10 11:59	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 12:01	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0017		W039346	DT	10/07/10 11:59	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 12:01	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 12:00	
EPA 6010B	**Zinc**	0.0488	mg/L	0.0100	0.0019		W039346	DT	10/07/10 12:01	

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Laboratory Director

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IDEQ (Boise)
1410 N Hilton
Boise, ID 83706

Project Name: Boise
Work Order **W0I0611**
Reported: 07-Oct-10 15:30

Client Sample ID: **SMCSW2**
SVL Sample ID: **W0I0611-04 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 14-Sep-10 08:15
Received: 23-Sep-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		W040059	JAA	09/30/10 11:05	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 11:55	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W039346	DT	10/07/10 11:55	
EPA 6010B	**Barium**	0.0068	mg/L	0.0020	0.0005		W039346	DT	10/07/10 11:55	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 11:55	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 11:55	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 11:55	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W039346	DT	10/07/10 11:53	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 11:55	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0017		W039346	DT	10/07/10 11:53	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 11:55	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 11:55	
EPA 6010B	**Zinc**	0.0163	mg/L	0.0100	0.0019		W039346	DT	10/07/10 11:55	

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Laboratory Director

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IDEQ (Boise)
1410 N Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W0I0611**
Reported: 07-Oct-10 15:30

Client Sample ID: **SMCSW3**
SVL Sample ID: **W0I0611-03 (Surface Water)**

Sampled: 14-Sep-10 11:54
Received: 23-Sep-10
Sampled By: BG

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000065		W040059	JAA	09/30/10 11:03	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 11:49	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.006		W039346	DT	10/07/10 11:49	
EPA 6010B	**Barium**	0.0076	mg/L	0.0020	0.0005		W039346	DT	10/07/10 11:49	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 11:49	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 11:49	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 11:49	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W039346	DT	10/07/10 11:48	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0040		W039346	DT	10/07/10 11:49	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0.0017		W039346	DT	10/07/10 11:48	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 11:49	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W039346	DT	10/07/10 11:49	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W039346	DT	10/07/10 11:49	

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Nan Wilson
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: **W0I0611**
Reported: 07-Oct-10 15.30

Client Sample ID: **WMSPPE1**
SVL Sample ID: **W0I0611-02 (Surface Water)**

Sampled: 14-Sep-10 08 30
Received: 23-Sep-10
Sampled By: BG

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	< 0.00020	mg/L	0 00020	0.000065		W040059	JAA	09/30/10 11:01	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.004		W039346	DT	10/07/10 11:43	
EPA 6010B	Arsenic	< 0.025	mg/L	0 025	0.006		W039346	DT	10/07/10 11:43	
EPA 6010B	**Barium**	0.0045	mg/L	0 0020	0.0005		W039346	DT	10/07/10 11:43	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W039346	DT	10/07/10 11:43	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0009		W039346	DT	10/07/10 11:43	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.005		W039346	DT	10/07/10 11:43	
EPA 6010B	Iron	< 0.060	mg/L	0.060	0.027		W039346	DT	10/07/10 11.42	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0 0040		W039346	DT	10/07/10 11 43	
EPA 6010B	Manganese	< 0.0040	mg/L	0.0040	0 0017		W039346	DT	10/07/10 11:42	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W039346	DT	10/07/10 11:43	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0 0014		W039346	DT	10/07/10 11:43	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0019		W039346	DT	10/07/10 11:43	

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Laboratory Director