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REFERENCE 4

Ecology & Environment Inc., April 1998, *Black Butte Mine, Site Inspection Report, TDD: 98-04-0004,* prepared for the U.S. Environmental Protection Agency, 317 pages.

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REFERENCE 4

Black Butte Mine
Site Inspection Report
TDD: 98-04-0004

Contract: 68-W6-0008
April 1998

Region 10

START

Superfund Technical Assessment and Response Team

Submitted To: Mark Ader, Task Monitor
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

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SITE INSPECTION REPORT
BLACK BUTTE MINE
COTTAGE GROVE, OREGON
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LIST OF ACRONYMS

Acronym	Definition
BBM	Black Butte Mine
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CLP	Contract Laboratory Program
CRDL	Contract Required Detection Limit
CRQL	Contract-Required Quantitation Limit
DQO	Data Quality Objective
E & E	Ecology and Environment, Inc.
ESDA	United States Department of Agriculture
FEMA	Federal Emergency Management Agency
GPS	Global Positioning System
IDW	Investigation-Derived Waste
J	Estimated Quantities
MCL	Maximum Contaminant Level
MS	Matrix Spike
µg/g	micrograms per gram
NPL	National Priorities List
NWI	National Wetlands Inventory
OCS	Oregon Climate Service
ODEQ	Oregon Department of Environmental Quality
ONHP	Oregon Natural Heritage Program
OSU	Oregon State University
OWRD	Oregon Water Resources Department
%R	Percent Recovery
PA	Preliminary Assessment
PPE	Probable Points of Entry
ppm	parts per million
QA/QC	Quality Assurance/Quality Control

LIST OF ACRONYMS (CONTINUED)

Acronym	Definition
"R"	Rejected
RPD	Relative Percent Difference
SI	Site Inspection
SQAP	Sampling and Quality Assurance Plan
SQL	Sample Quantitation Limit
START	Superfund Technical Assessment and Response Team
TAL	Target Analyte List
TDL	Target Distance Limit
U	Not Detected
USCB	United States Census Bureau
USDC	United States Department of Commerce
USGS	United States Geological Survey

SITE INSPECTION REPORT
BLACK BUTTE MINE
COTTAGE GROVE, OREGON

1. INTRODUCTION

Ecology and Environment, Inc. (E & E) was tasked by the to provide technical support for completion of a Site Inspection (SI) at the Black Butte Mine located near Cottage Grove, Oregon. E & E conducted the SI activities under Technical Direction Document No. 98-04-0004, issued under EPA Region 10, Superfund Technical Assessment and Response Team (START) Contract No. 68-W6-0008. The specific goals identified by EPA for the Black Butte Mine SI are:

- Document a threat or potential threat to public health or the environment posed by the site,
- Identify if a potential emergency situation exists that may require an immediate response,
- Assess the eligibility of the site for National Priorities List (NPL) inclusion, and
- Document the presence or absence of uncontained or uncontrolled hazardous substances on the site.

Activities conducted under this SI included reviewing previous information concerning the site, gathering new non-sampling environmental and geographic information, performing multi-media sampling at selected locations, and interviewing persons knowledgeable about past operations and ongoing site reclamation activities. Completion of the field investigation portion of the SI consisted of sampling activities performed at the mine and in nearby locations over a 5-day period in September 1998. The SI is intended to be an investigation of specific potential contaminant sources and environmental receptors, focusing on contaminants potentially existing at or released from the mine site. The SI is not intended to fully characterize the extent of potential contamination or to provide the basis for a quantitative assessment of human health or environmental risks posed by the site.

This document includes a discussion of site background information (Section 2), a discussion of SI field activities and analytical protocol (Section 3), a discussion of quality assurance/quality control (QA/QC) information (Section 4), a discussion of analytical results evaluation criteria and background sampling and analytical results (Section 5), a discussion of source sample locations and sample results (Section 6), a discussion of migration pathways and targets (Section 7), a summary of inspection findings and conclusions (Section 8), and a list of references (Section 9).

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2. SITE BACKGROUND

This section describes the site location (Section 2.1), a description of previous site operations (Section 2.2), site ownership history (Section 2.3), and previous investigations at and near the site (Section 2.4).

2.1 SITE LOCATION

Site Name:	Black Butte Mine
CERCLIS ID No.:	OR0000515759
Location:	Cottage Grove, Oregon
Latitude:	43°34' 42" North
Longitude:	123°03' 58" West
Legal Description:	Township 23 South, Range 3 West, NW ¼ Section 6.
Site Owner/Contact:	Land and Timber Company 408 Commercial Street Coos Bay, Oregon 97420

The Black Butte Mine (BBM) is located in a rural area approximately 10 miles south of Cottage Grove, Oregon. The site is situated on the south slope of Black Butte which is part of the Calapooya Divide. Access to the site is via a dirt road east of London Road (Figure 2-1).

2.2 SITE DESCRIPTION

The BBM is a former mercury mine. The primary features at the site include tailings piles, a former mill structure containing a rotary kiln, several old dilapidated buildings, a system of unimproved roads, and partially caved-in mine adits (Figure 2-2). Much of the mine area was logged during the early 1990s, at which time several old mine structures were reportedly demolished. Access to the site is restricted by a locked gate; however, a dirt road leading onto the site from London Road crosses private property (b) (6) residence). Adjacent to the mine area is Dennis Creek, which flows westward to Garoutte Creek. Garoutte Creek flows northward to the Coast Fork of the Willamette River, which empties into Cottage Grove Reservoir (Figure 2-1).

2.3 SITE OWNERSHIP HISTORY

The original operator/owner of the mine was the Quicksilver Mining Company, which managed the operations until 1909 when the mine closed because of depressed mercury prices (Brooks 1971). The mine was re-opened in 1916 by a New York company under the management of Earl B. Crane (Brooks 1971). In 1927, the mine was purchased by the Quicksilver Syndicate (Brooks 1971). Mining operations continued until 1943 under this ownership, when mercury prices again forced closure of the mine (Brooks 1971). In 1956, the mine was again re-opened under lease to the Mercury and Chemical Corporation of New York (Brooks 1971). Information regarding the mine's subsequent ownership and operator are not documented in available literature. The current owner of the mine property is the Land and Timber Company of Coos Bay, Oregon (ODEQ 1996).

2.4 SITE OPERATIONS AND WASTE CHARACTERISTICS

The BBM was developed in the late 1890s. The BBM was the fourth largest mercury-producing mine in Oregon. Between 1900 and 1957, a total of 16,094 flasks of elemental mercury were produced at the mine (1 flask equals 76 pounds). Peak production occurred between the years 1927 to 1943. After 1943, the mine operated intermittently until its final abandonment in the late 1960s (ODEQ 1996).

Mercury-bearing ore (cinnabar) was extracted from underground mine tunnels and transported to the surface via light rail cars (Brooks 1971). Ore was crushed on site in one of three mills used at the site during its operational years. Within the mills, the crushed ore was heated in a rotary kiln where the elemental mercury was vaporized and subsequently condensed and captured for bottling (ODEQ 1996). Three mill sites are known to have existed at the Black Butte Mine (E & E 1998a). The location of the original mill is not known. The second mill, which reportedly operated from the early 1900s until the 1950s, reportedly was located south (uphill) of the tailings pile (b) (6) 1998). This mill site is currently heavily covered with brush and trees (E & E 1998a). START was unable to locate the remains of this mill during the SI fieldwork. The third mill, which operated from the 1950s until the mine's closure in the 1970s, is still present (b) (6) 1998). A rotary kiln, mercury condenser, and ore storage/crushing equipment are contained within the wooden mill structure (E & E 1998a; Figure 2-3).

Tailings from the ore milling operations were deposited north (downhill) of the mill observed during the SI toward Dennis Creek. The tailings form two "piles," essentially part of the same tailings deposit but separated by dense brush on the surface. The two "piles" include an "upper" pile and a "lower" pile: the "upper" pile is immediately below the mill site, while the "lower" pile has a north-facing side slope that angles steeply downward toward Dennis Creek. The toe of the "lower" tailings pile is approximately 30 feet from Dennis Creek (Figure 2-2; E & E 1998). The "piles" reportedly contain an estimated total of 300,000 cubic yards of tailings (ODEQ 1996).

One open mine adit exists at the site. The adit is located uphill (south) of the tailings piles and mill site on a steep slope at an elevation of approximately 1,600 feet above sea level. The adit, which is connected to the rest of the mine's underground workings, is filled with water which flows into a ditch and runs downhill into dense underbrush. The downstream discharge point for this water is unknown; a drainage from the adit through the tailings area was not located during the SI (E & E 1998).

2.5 SITE CHARACTERIZATION

This section discusses the previous investigations (Section 2.5.1) and the START site visit (Section 2.5.2).

2.5.1 Previous Investigations

In 1990 the Oregon State University (OSU) Department of Fisheries and Wildlife conducted a study to characterize the quality of sediments and aquatic biota tissues in three Oregon reservoirs, one of which was the Cottage Grove Reservoir, located approximately 6 miles downstream of BBM. Samples collected from within and near the Cottage Grove Reservoir included tissues from five large-mouth bass and ten sediment samples. Mercury was detected in fish tissue at concentrations of up to 1.79 parts per million (ppm) and in reservoir sediment samples at up to 1.11 micrograms per gram (μg/g; OSU 1991).

The United States Geological Survey (USGS) collected sediment samples near BBM in 1992 and 1993 as part of a periodic state-wide sampling program. Sample results indicated the presence of mercury in sediments collected from Dennis Creek at concentrations up to 2.5 ppm, in sediments collected from the Coast Fork of the Willamette River up to 1.4 ppm, and in sediments in Cottage Grove reservoir up to 0.50 ppm (USGS 1993).

OSU researchers conducted additional sampling at and near BBM in 1994. Sampling data indicated the presence of mercury in soils in the vicinity of the rotary kiln at concentrations up to approximately 350 mg/kg. Mercury was detected in Dennis and Garoutte Creek sediments downstream of BBM up to concentrations of 267 mg/kg, which supports the conclusion that elevated mercury concentrations can be traced to the Dennis Creek drainage, and may result from off-site transport of tailings from BBM.

In 1996 the Oregon Department of Environmental Quality (ODEQ) prepared a Preliminary Assessment (PA) of BBM under a cooperative agreement with EPA. The PA involved the collection and assessment of existing analytical and environmental information and an on-site reconnaissance of the mine. The PA report concluded that further evaluation of BBM under Comprehensive Environmental Response Compensation and Liability Act (CERCLA) was necessary to fully evaluate the threats posed

by on-site contaminants. On-site soil, surface water, and groundwater were identified as the pathways of most concern.

2.5.2 START Site Visit

Prior to visiting the BBM site, the START personnel met with ODEQ staff and collected additional background information regarding the site. During the site visit on May 28, 1998, the tailings piles were observed. Dennis Creek flows within 30 feet of the tailings for a linear distance of approximately 600 feet. Several old mine-related buildings were observed, although no hazardous substance sources were identified around these buildings. An on-site well was observed along the road to the adit location; the depth and construction details of the well are unknown. An open adit, previously identified by ODEQ staff, could not be accessed because of rough road conditions. Figure 2-2 illustrates the major site features observed during the site visit.

2.6 SUMMARY OF SI INVESTIGATION LOCATIONS

Based on review of background information and results of the site visit, three primary on-site features at the Black Butte Mine were identified for investigation under the SI as potential hazardous substance sources. Additionally, on- and off-site locations considered to be potential receptors of contamination that may migrate from the sources were identified for investigation. The sources and receptors investigated during the SI are outlined below.

Potential Sources include the following:

- **Mine Tailings.** An estimated 300,000 cubic yards of mine tailings have been deposited at the site. Previous sampling of creek sediments below the tailings suggests that the tailings are a source of elemental mercury.
- **Former Mill/Rotary Kiln.** Soils in the vicinity of the mill contain mercury up to concentrations of 350 mg/kg. The quantity of contaminated soil underlying the mill is unknown, but the mill covers an estimated area of approximately 1,800 square feet.
- **Mine Adit.** The open mine adit is filled with water that flows downhill toward Dennis Creek. The mine drainage may be acidic and is a possible source of heavy metals.

The migration pathway features include the following:

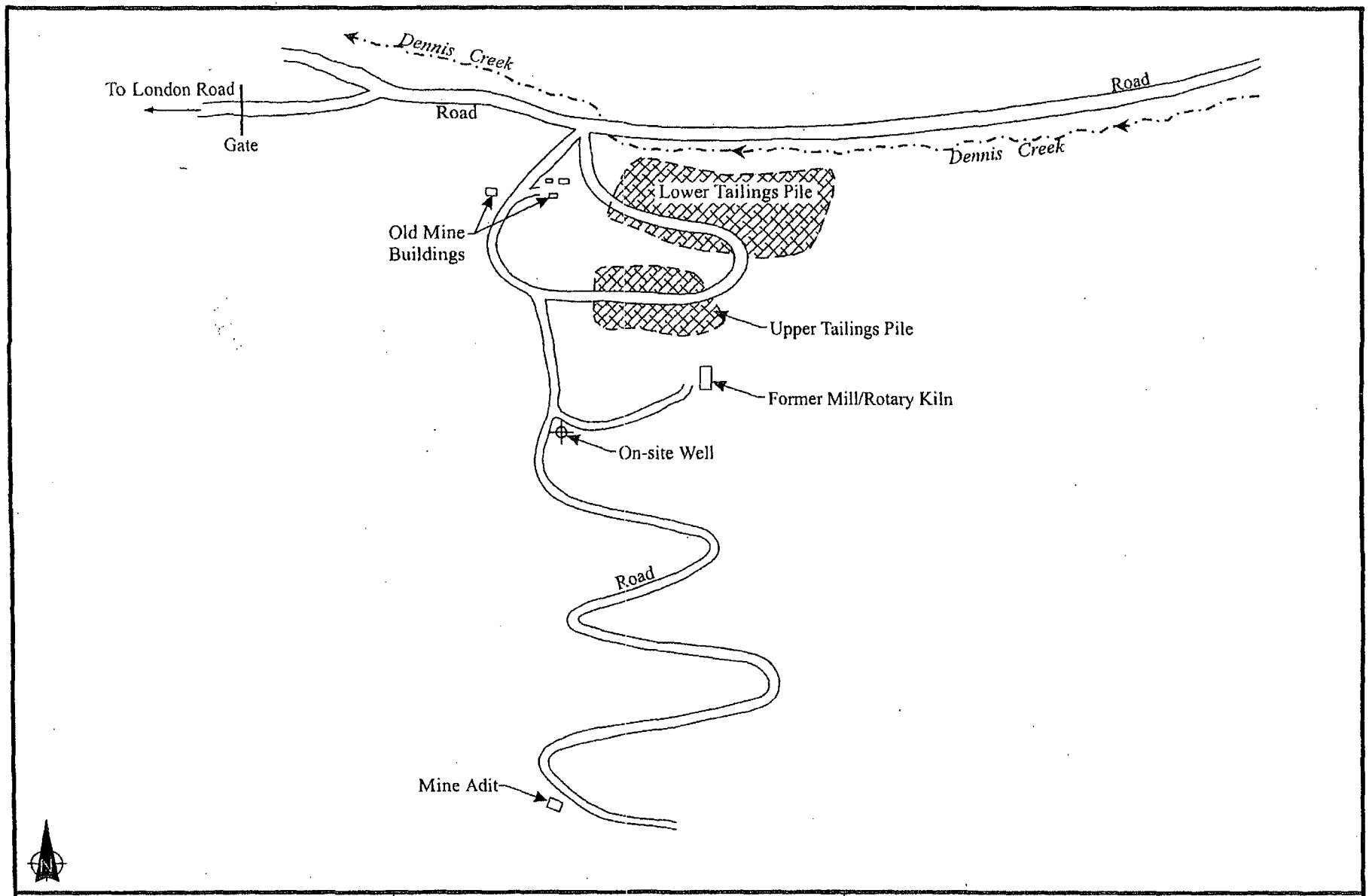
- **Groundwater.** Groundwater occurs in fractured bedrock in the site area, which may be in hydraulic connection with underground mine workings.

- **Dennis Creek.** Dennis Creek drains the BBM area. The "lower" tailings pile fronts approximately 600 feet of the creek, and mine tailings are located within 30 feet of the creek bed.
- **Garoutte Creek.** Dennis Creek flows into Garoutte Creek approximately 0.25 miles downstream of BBM. Garoutte Creek flows northward to a confluence with the Big River, forming the Coast Fork of the Willamette River. The Coast Fork of the Willamette River flows into Cottage Grove Reservoir.

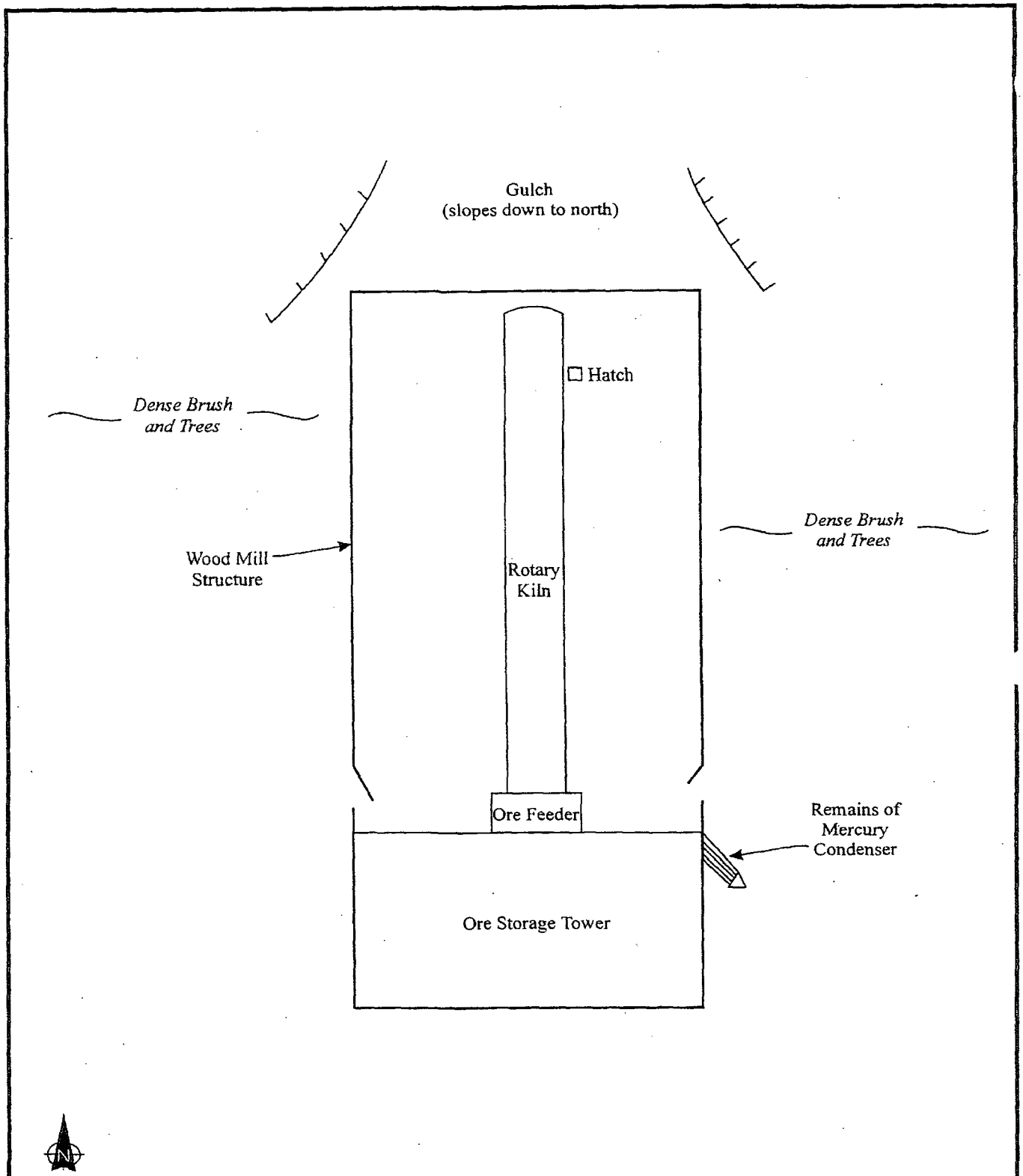
The primary targets associated with site include the following:

- **Drinking Water Wells.** Approximately 64 domestic water wells are located within 4 miles of the site. The majority of these wells are located in the floodplain of Garoutte Creek and the Coast Fork of the Willamette River. In addition, at least one spring in the site vicinity is used for drinking purposes. The nearest well to the site is located approximately 0.5 miles from the mine tailings area of the site.
- **Wetlands.** Palustrine Forested and Palustrine Emergent wetlands exist along the Coast Fork of the Willamette River, starting approximately 1.9 miles downstream of the site. These wetlands front the river nearly continuously for approximately 4.7 miles to Cottage Grove Reservoir. Cottage Grove Reservoir is bordered by Palustrine Emergent wetlands in several locations, with wetland frontage of approximately 1.7 miles along the lake. No additional wetlands exist within the Target Distance Limit along the Coast Fork of the Willamette River downstream of Cottage Grove Reservoir.
- **Fisheries.** Sport fishing is conducted in Garoutte Creek, the Coast Fork of the Willamette River, and Cottage Grove Reservoir. Species harvested include Cutthroat trout and Bull trout (Dolly Varden). Garoutte Creek is a spawning and migration area for Cutthroat trout.
- **Threatened and Endangered Species.** One endangered species, two threatened species, and four species of concern are known to use terrestrial habitat in the site vicinity.

ecology and environment, inc. International Specialists in the Environment Seattle, Washington	BLACK BUTTE MINE Cottage Grove, Oregon	Figure 2-1 SITE VICINITY MAP BLACK BUTTE MINE			
	SOURCE: DeLorme, 1991, Scale 1:150,000	Drawn: AES	Date 2/24/99	Job No. CD0401SIT0	Dwg.No. CD0401 2-1



ecology and environment, inc. International Specialists in the Environment Seattle, Washington	BLACK BUTTE MINE SI Cottage Grove, Oregon	Figure 2-2 SITE MAP			
	0 300 600 Approximate Scale in Feet	Drawn: AES	Date 3/26/99	Job No. CD0401SIT0	Dwg.No. CD0401 2-2



ecology and environment, inc. International Specialists in the Environment Seattle, Washington	BLACK BUTTE MINE SI Cottage Grove, Oregon	Figure 2-3 FORMER MILL/ROTARY KILN MAP			
recycled paper	0 5 10 Approximate Scale in Feet	Drawn: AES	DATE: 2/24/99	JOB NO. CD0401SIT0	Dwg.No. CD0401 2-3

3. FIELD ACTIVITIES AND ANALYTICAL PROTOCOL

A sampling and quality assurance plan (SQAP) was developed for the Black Butte Mine SI prior to fieldwork (E & E 1998b). The SQAP describes the sampling strategy, sampling methodology, and analytical procedures to investigate potential hazardous substance sources at the mine and nearby targets. No deviations to the sampling methodologies presented in the SQAP were implemented during the SI with the exception of the type of equipment used to collect subsurface soil samples (Section 3.1.4).

The SI fieldwork was conducted between August 31 and September 3, 1998. A total of 52 samples were collected during the SI (excluding quality control samples). Specific descriptions of sample locations are provided in Sections 6 and 7. Table 3-1 summarizes the number, location, and analytical parameters for the sample collected during the SI. Photographic documentation of all sample locations is provided in Appendix A.

3.1 SAMPLING METHODOLOGY

Grass, leaves, rocks, and other debris unsuitable for analyses were removed from samples before being placed into sample containers. All solid matrix samples were thoroughly homogenized with clean dedicated stainless steel utensils prior to containerization. Samples were placed into prelabeled containers and preserved when appropriate. All samples were stored under E & E's custody in sealed coolers with ice until shipment.

3.1.1 Surface Water Samples

Eight surface water samples were collected from Dennis Creek, Garoutte Creek, and the mine adit. Samples were collected at downstream locations before moving to upstream locations in order to minimize introduction of suspended solids into the samples. For sample stations where collocated surface water/sediment samples were collected, the surface water sample was collected prior to the corresponding sediment sample. During collection of all surface water samples, care was taken to avoid introduction of sediment into the sample containers.

These samples were collected by hand-dipping the prelabeled 1-liter polyethylene sample containers directly into the water to a depth of approximately 2 inches below the water surface.

3.1.2 Sediment Samples

Eight sediment samples (including background samples) were collected from Dennis Creek, Garoutte Creek, and the mine adit. These samples were collected at depths ranging from 0 to 4 inches in depth below the sediment surface. The sample material was collected using clean, dedicated, plastic spoons, and was placed directly into clean, dedicated, plastic mixing bowls for homogenization. Following thorough homogenization, the sediment was transferred to prelabeled 8-ounce glass jars.

3.1.3 Groundwater Samples

Eleven groundwater samples (including a background sample) were collected from existing domestic wells and two springs in the site area. Groundwater samples were collected following a minimum purging time of 20 minutes and after water quality parameters (pH, conductivity, temperature) had stabilized within 10 percent of the previous reading.

The domestic well groundwater samples were collected by pumping the well water directly into the sample containers from a port as near the wellhead as possible. The spring groundwater samples were collected by hand dipping the prelabeled sample container approximately 2 inches below the spring water surface. During sampling, care was taken not to disturb any sediment on the bottom of the springs. Groundwater collected via a bailer from the on-site well was transferred directly to prelabeled sample containers. The on-site well was not purged prior to sample collection because of a down-hole obstruction and the quantity of water that would need to be removed from the 6-inch diameter well.

3.1.4 Soil Samples

Fourteen surface soil samples were collected from the mine tailings, the former mill/rotary kiln, and background locations. All samples were collected with clean, dedicated plastic spoons and transferred to a clean, dedicated plastic bowl for homogenization. Following thorough homogenization, the sample material was placed directly into prelabeled sample containers.

Eleven subsurface soil samples were collected from the mine tailings, the former mill/rotary kiln, and a background location. The subsurface soil samples were collected using two methods: a powered rotary auger and a combination of a hand shovel and stainless steel hand auger. The latter method was used for the collection of subsurface soil samples at the "lower" tailings because of refusal of the powered auger at shallow depths, and at the former mill/rotary kiln because of physical access limitations. Use of the hand shovel and stainless steel hand auger represents a modification to the subsurface soil sampling protocol in the SQAP that specified the use of the powered auger. Following retrieval of subsurface soil in the hand auger, the sample was collected with clean, dedicated plastic

spoons and transferred to a clean, dedicated plastic bowl for homogenization. Following thorough homogenization, the sample material was placed directly into prelabeled sample containers.

3.1.5 Quality Control Samples

Two QC rinsate samples were collected from non-dedicated sampling instruments used during the SI, including the hand shovel and the hand auger. The rinsate samples were collected following decontamination of each tool, using the same process used prior to sample collection. Deionized water was poured over and through each of the pieces of equipment and collected directly into prelabeled sample containers.

3.2 ANALYTICAL PROTOCOL

All samples collected during the SI were submitted for off-site laboratory analyses; no field analytical screening was conducted. Analytical methods applied to SI samples included EPA Target Analyte List (TAL) inorganic elements (23 elements; Method ILM 4.0).

The TAL inorganic analyses were performed at EPA's Region 10 Laboratory at Manchester, Washington, using EPA Contract Laboratory Program (CLP) protocols.

3.3 GLOBAL POSITIONING SYSTEM

A Trimble Pathfinder Professional global positioning system (GPS) was used in the field to survey SI sampling points and boundaries of major site features. However, at nearly every survey location, the GPS system was unable to provide reliable coordinates as a result of either poor satellite coverage, topography, or overhead obstructions (trees, dense underbrush). GPS data is therefore unavailable for the SI. Sample and feature locations indicated on the maps in this report were determined using ground-level measurements in the field, plotted on topographic maps and an aerial photograph.

3.4 INVESTIGATION-DERIVED WASTE MANAGEMENT

Investigation-derived waste (IDW) generated during the SI fieldwork consisted of the following:

- Decontamination fluids;
- Used dedicated sampling equipment; and
- Used disposable personal protective equipment.

Decontamination fluids were evaporated to the extent possible during the fieldwork. At the conclusion of the fieldwork, approximately 5 gallons of fluids remained. This waste was transported in a

55-gallon drum to E & E's Seattle warehouse and is pending disposal. Used personal protective equipment and dedicated sampling equipment was rinsed, placed in doubled plastic bags and disposed of in Seattle at a municipal landfill. No IDW from the SI field activities remains at the site.

Table 3-1

SAMPLE SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

E & E Station Identification	EPA Sample Identificaiton	Sample Collection Date	Sample Collection Time	Matrix	Analytical Parameters	Location Description
98BBDW01GW	98364100	9/1/98	1120	Groundwater	TAL Inorganics	(b) residential well
98BBDW02GW	98364101	9/1/98	1325	Groundwater	TAL Inorganics	(b) (6) residential well
98BBDW03GW	98364102	9/1/98	1410	Groundwater	TAL Inorganics	(b) residential well
98BBDW04GW	98364103	9/1/98	1455	Groundwater	TAL Inorganics	(b) (6) residential well
98BBDW05GW	98364104	9/1/98	1525	Groundwater	TAL Inorganics	(b) (6) residential well
98BBDW06GW	98364105	9/2/98	1024	Groundwater	TAL Inorganics	(b) residential well
98BBDW07GW	98364106	9/2/98	1315	Groundwater	TAL Inorganics	On-site spring (spigot)
98BBDW08GW	98364107	9/2/98	1400	Groundwater	TAL Inorganics	(b) (6) residential well
98BBDW09GW	98364108	9/2/98	1430	Groundwater	TAL Inorganics	(b) (6) residential well (background)
98BBDW10GW	98364109	9/2/98	1645	Groundwater	TAL Inorganics	On-site well (6")
98BBSP01GW	98364112	9/3/98	1400	Groundwater	TAL Inorganics	(b) spring
98BBDC01SW	98364114	9/1/98	1340	Surface Water	TAL Inorganics	Mouth of Dennis Creek
98BBDC01SD	98364123	9/1/98	1345	Sediment	TAL Inorganics	Mouth of Dennis Creek
98BBDC02SW	98364116	9/2/98	1038	Surface Water	TAL Inorganics	Dennis Creek below mine road
98BBDC02SD	98364125	9/2/98	1045	Sediment	TAL Inorganics	Dennis Creek below mine road
98BBDC03SW	98364117	9/2/98	1235	Surface Water	TAL Inorganics	Dennis Creek below tailings
98BBDC03SD	98364126	9/2/98	1242	Sediment	TAL Inorganics	Dennis Creek below tailings
98BBDC04SW	98364118	9/2/98	1320	Surface Water	TAL Inorganics	Dennis Creek below tributary
98BBDC04SD	98364127	9/2/98	1324	Sediment	TAL Inorganics	Dennis Creek below tributary
98BBDC05SW	98364119	9/2/98	1344	Surface Water	TAL Inorganics	Dennis Creek background
98BBDC05SD	98364128	9/2/98	1346	Sediment	TAL Inorganics	Dennis Creek background
98BBGC01SW	98364113	9/1/98	1322	Surface Water	TAL Inorganics	Garoutte Creek below Dennis Creek
98BBGC01SD	98364122	9/1/98	1330	Sediment	TAL Inorganics	Garoutte Creek below Dennis Creek
98BBGC02SW	98364115	9/1/98	1436	Surface Water	TAL Inorganics	Garoutte Creek background
98BBGC02SD	98354124	9/1/98	1444	Sediment	TAL Inorganics	Garoutte Creek background
98BBMA01SW	98364121	9/3/98	1015	Surface Water	TAL Inorganics	Mine Adit
98BBMA01SD	98364129	9/3/98	1020	Sediment	TAL Inorganics	Mine Adit
98BBMT01SS	98364130	9/3/98	1025	Surface Soil	TAL Inorganics	Upper tailings surface-east side
98BBMT01SB	98364136	9/3/98	1045	Subsurface Soil	TAL Inorganics	Upper tailings subsurface-east side
98BBMT02SS	98364131	9/3/98	1056	Surface Soil	TAL Inorganics	Upper tailings surface-west side
98BBMT02SB	98364137	9/3/98	1108	Subsurface Soil	TAL Inorganics	Upper tailings subsurface-west side
98BBMT03SS	98364132	9/3/98	1204	Surface Soil	TAL Inorganics	Lower tailings surface-west side

Key at end of table.

Table 3-1

SAMPLE SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

E & E Station Identification	EPA Sample Identification	Sample Collection Date	Sample Collection Time	Matrix	Analytical Parameters	Location Description
98BBMT06SB	98364141	9/3/98	1354	Subsurface Soil	TAL Inorganics	Lower tailings subsurface-east side
98BBMK01SS	98364142	9/2/98	1545	Surface Soil	TAL Inorganics	Outside mill door-east side
98BBMK02SS	98364143	9/2/98	1550	Surface Soil	TAL Inorganics	Inside mill-near feeder
98BBMK03SS	98364144	9/2/98	1600	Surface Soil	TAL Inorganics	Outside mill door-west side
98BBMK04SS	98364145	9/2/98	1610	Surface Soil	TAL Inorganics	Outside mill-east side foundation
98BBMK05SS	98364146	9/2/98	1620	Surface Soil	TAL Inorganics	Northeast side of mill
98BBMK06SS	98364147	9/2/98	1624	Surface Soil	TAL Inorganics	Northwest side of mill
98BBMK01SB	98364148	9/3/98	1445	Subsurface Soil	TAL Inorganics	Same location as MK01SS
98BBMK02SB	98364149	9/3/98	1455	Subsurface Soil	TAL Inorganics	Mill floor trap door
98BBMK03SB	98364150	9/3/98	1525	Subsurface Soil	TAL Inorganics	Same location as MK05SS
98BBMK04SB	98364151	9/3/98	1536	Subsurface Soil	TAL Inorganics	Same location as MK06SS
98BBBG01SS	98364152	9/3/98	1430	Surface Soil	TAL Inorganics	Background surface soil
98BBBG02SS	98364153	9/3/98	1640	Surface Soil	TAL Inorganics	Background surface soil
98BBBG01SB	98364154	9/3/98	1435	Subsurface Soil	TAL Inorganics	Background subsurface soil
98BBRS01WA	98364155	9/3/98	1605	Water	TAL Inorganics	Rinsate-Hand Auger
98BBRS02WA	98364156	9/3/98	1607	Water	TAL Inorganics	Rinsate-Shovel

Key:

E & E = Ecology and Environment, Inc.
EPA = U.S. Environmental Protection Agency.
TAL = Target Analyte List.

4. QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance/quality control (QA/QC) data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware, and reagents. Specific QC requirements for laboratory analysis are incorporated in EPA's *CLP Statement of Work for Inorganic Analysis* (ILM04.0, EPA 1991). These QC requirements or equivalent requirements were followed for analytical work performed on the Black Butte Mine SI. This section describes the QA/QC measures taken for the SI and provides an evaluation of the usability of data presented in this report.

All samples were collected following the guidance of the SQAP (E & E 1998b) for the field activities. Inorganic element analyses were performed by EPA's Region 10 Laboratory following ILM04.0 (EPA 1991).

All data from analyses performed at the laboratory was reviewed and validated by EPA chemists. Data qualifiers were applied as necessary according to the following guidance document:

- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (February 1994).

Copies of the data validation memoranda are included in Appendix B.

4.1 SATISFACTION OF DATA QUALITY OBJECTIVES

The following EPA guidance document was used to establish data quality objectives (DQOs) for this SI:

- *Data Quality Objectives Process for Superfund, Interim Final Guidance,* September 1993).

The EPA determined that definitive data without error and bias determination criteria would be used for the sampling and analyses conducted during the field activities. The data quality achieved during the fieldwork was sufficient in producing data that could be used for the data objectives stated in the SQAP (E & E 1998b).

A detailed discussion of the SI objectives that were accomplished is presented in the following sections.

4.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

QC samples included laboratory duplicate samples and matrix spike (MS) samples at a rate of one duplicate and MS per 20 samples per matrix.

The analytical laboratory also analyzed several QC samples for quality assurance purposes according to the methods, including initial and continuing calibrations, method blanks, matrix spikes, duplicates, and laboratory control samples.

4.3 PROJECT-SPECIFIC DATA QUALITY OBJECTIVES

The laboratory data were reviewed to ensure that the DQOs for the project were met. The following describes the abilities of the laboratories to meet the project DQOs for precision, accuracy, and completeness and the field team's ability to meet project DQOs for representativeness and comparability. The laboratories and the field team were able to meet DQOs for the project. See the attached quality assurance memoranda in Appendix B for qualifiers applied to data based on QC outliers.

4.3.1 Precision

Precision measures the reproducibility of the sampling and analytical methodology. Laboratory and field precision is defined as the relative percent difference (RPD) between duplicate sample analyses. The laboratory duplicate samples measure the precision of the analytical method. For this project, none of the results were qualified based on duplicate sample analysis results.

4.3.2 Accuracy

Accuracy measures the reproducibility of the sampling and analytical methodology. Laboratory accuracy is defined as the matrix spike percent recovery (%R). The matrix spike values were reviewed for all MS analyses. Approximately 6.0% of the data were qualified as estimated quantities ("J" or "UJ") based on MS recoveries. Approximately 2.7% of the data were rejected ("R") based on MS recoveries. Overall, the project DQOs outlined in the SQAP (E & E 1998b) for accuracy were met.

4.3.3 Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). All laboratory data were reviewed for data validation and usability. Approximately

97.3% of the data were determined to be usable, therefore, the project DQO for completeness of 90% was met.

4.3.4 Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were determined in the field to account accurately for site variations and sample matrices. Based on this rationale, the DQOs for representativeness were met.

4.3.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this site followed applicable field sampling techniques and specific analytical methodology outlined in the SQAP (E & E 1998b). The DQOs for comparability were met.

4.4 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL PARAMETERS

The laboratory data also were reviewed for holding times, laboratory blank samples, rinsate blank samples, initial and continuing calibrations, and laboratory control samples. These QA/QC parameters are summarized below. In general, the laboratory and field QA/QC parameters were considered acceptable.

4.4.1 Holding Times

None of the sample results were qualified based on holding time outliers.

4.4.2 Laboratory Blanks

All laboratory blanks met the frequency criteria. Barium and antimony were detected in the laboratory blanks. Any associated sample results less than five times the blank contamination were qualified as not detected ("U"). Associated sample results were qualified as estimated quantities ("J") if the sample result was less than five times the absolute value of the negative blank concentration. See the data validation memoranda (Appendix B) for sample results that were qualified based on blank contamination.

4.4.3 Rinsate Blanks

All rinsate blanks met the frequency criteria. Chromium, manganese, nickel, arsenic, and lead were detected in both rinsate blanks. The nickel and chromium results in samples 98BBMT01SS and 98BBMT01SB were qualified as not detected ("U") based on rinsate blank results. No other sample qualifications were required based on the rinsate concentrations, indicating that the equipment decontamination procedures were acceptable.

4.4.4 Initial and Continuing Calibrations

All calibrations met the frequency criteria. No qualifications were applied based on calibration results.

4.4.5 Laboratory Control Samples

All laboratory control sample analyses met the frequency criteria. Approximately 2.7% of the sample results were qualified as estimated quantities ("J" or "UJ") based on laboratory control sample outliers.

5. ANALYTICAL RESULTS REPORTING AND BACKGROUND SAMPLES

This section describes the reporting criteria and reporting methods applied to analytical results presented in Sections 6 and 7 of this report. A discussion of background locations and sample results also is provided. A list of samples collected for laboratory analyses appears in Table 3-1.

5.1 ANALYTICAL RESULTS EVALUATION CRITERIA

Analytical results presented in the summary tables in Section 6 and 7 show all elements detected above laboratory detection limits in bold type. Analytical results indicating significant concentrations of contaminants in source samples (Section 6) with respect to background concentrations are shown underlined and in bold type. Similarly, analytical results indicating elevated concentrations of contaminants in target samples (Section 7) with respect to background concentrations also are underlined and in bold type. For the purposes of this investigation, significant or elevated concentrations are those concentrations that are:

- Equal to or greater than the sample's contract-required quantitation limit/contract required detection limit (CRQL/CRDL) or the sample quantitation limit (SQL) when a non-CLP laboratory is used; and
- Equal to or greater than the background soil sample's CRQL/CRDL or SQL when the background concentration is below detection limits; or
- At least three times greater than the background soil concentration when the background concentration equals or exceeds the detection limit.

The analytical summary tables present all detected compounds, but only those detected analytes at potential sources or in targets meeting the significant or elevated concentration criteria are discussed in the report text.

For analytical results that are qualified as estimated, the sample concentration was adjusted as described in *Using Qualified Data to Document an Observed Release and Observed Contamination* (EPA 1996) before determining whether the concentration is significant or elevated. For target locations, only those analytes that also were detected in a source at the site were evaluated to determine whether their concentrations were elevated. All hazardous substances detected at target locations and meeting evaluation criteria can be used to document an observed release from the site to the target. When

samples were diluted for re-analysis at the laboratory, the dilution results were considered for evaluation and are provided in the tables.

5.1.1 Sample Results Reporting

Based on EPA Region 10 policy, evaluation of aluminum, calcium, iron, magnesium, potassium, and sodium (common earth crust elements) generally is employed only in water mass tracing, which is beyond the scope of this report. For this reason, the presence and distribution of these elements are not discussed in this report. For source and target analytical results, only those concentrations meeting the significant/elevated concentration criteria are discussed. For background samples, all detected concentrations are discussed.

5.2 BACKGROUND SAMPLES

Background samples were collected for each of the media from which SI samples were collected. These media include surface soil, subsurface soil, groundwater, sediment, and surface water. Results for the appropriate background sample(s) appear as the first column in the analytical results summary tables in Sections 6 and 7 to facilitate comparison against source or target results.

5.2.1 Background Soil

This section discusses sample locations (Section 5.2.1.1) and sample results (Section 5.2.1.2).

5.2.1.1 Sample Locations

Two off-site background surface soil samples and one off-site background subsurface soil sample were collected. The surface soil background samples were collected in a forested area approximately 100 yards from London Road, approximately 0.5 miles west of the mine. Background surface soil sample 98BBBG01SS was collected from a depth of 0 to 6 inches and consisted of brown, sandy, rocky soil, consistent with the nature of the on-site mine tailings (surface) samples. Background surface soil sample 98BBBG02SS was collected from a depth of 0 to 6 inches, and consisted of brown, loamy, silty soil, consistent with the matrix of surface soil samples collected at the former mill/rotary kiln area on the site. The background subsurface soil sample was collected in a forested area approximately 0.5 mile west of the mine (same location as 98BBBG01SS) from a depth of 2 feet, consistent with the matrix of subsurface soil samples collected in the mine tailings and at the former mill/rotary kiln area.

5.2.1.2 Sample Results

Thirteen inorganic elements were detected in the background soil samples, ranging in concentration from 0.972 mg/kg (beryllium in sample 98BBBG01SS) to 3,520 mg/kg (manganese in sample 98BBBG02SS). The results of the background samples are included in Table 6 1 (98BBBG01SS and 98BBBG01SB), and Table 6-2 (98BBBG02SS and 98BBBG01SB). All of the background soil samples contained mercury at concentrations ranging from 5.48 mg/kg to 20.3 mg/kg. These concentrations likely result from naturally occurring, mercury-containing mineral deposits in the site area.

5.2.2 Background Groundwater

This section discusses the sample location (Section 5.2.2.1) and sample results (Section 5.2.2.2).

5.2.2.1 Sample Location

One background groundwater sample was collected from a private domestic well located approximately 1.5 miles north of the mine in the Combs Creek drainage (b) (6) well, 98BBDW09GW). This well is considered to be not hydraulically downgradient from the site. This sample was used to document background concentrations for the domestic well, springs, and mine adit water samples.

5.2.2.2 Sample Results

Six inorganic elements were detected in the background groundwater sample. The results of the sample are included in Table 7-2.

5.2.3 Background Sediment

This section discusses sample locations (Section 5.2.3.1) and sample results (Section 5.2.3.2).

5.2.3.1 Sample Locations

Two background sediment samples were collected for the SI. One sediment sample (98BBDC02SD) was collected from Dennis Creek approximately 0.5 mile upstream of the mine tailings to document background sediment concentrations applicable to Dennis Creek sediment samples and the Mine Adit sediment sample. One background sample (98BBGC02SD) was collected from Garoutte Creek approximately 600 feet upstream of the confluence with Dennis Creek to document background sediment concentrations for the sediment sample collected downstream of the confluence with Dennis Creek.

5.2.3.2 Sample Results

Twelve inorganic elements were detected in the two background sediment samples, ranging from 0.850 mg/kg (beryllium in sample 98BBDC05SD to 1,160 mg/kg (manganese in sample 98BBDC05SD). The results of the background sediment samples are included in Table 7-4.

5.2.4 Background Surface Water

This section discusses sample location (Section 5.2.4.1) and sample results (Section 5.2.4.2).

5.2.4.1 Sample Locations

Two background surface water samples were collected for the SI. One background surface water sample (98BBDC05SW) was collected from Dennis Creek approximately 0.5 mile upstream of the mine tailings to document background concentrations applicable to Dennis Creek surface water samples. One background surface water sample (98BBGC02SW) was collected from Garoutte Creek approximately 600 feet upstream of the confluence with Dennis Creek to document background concentrations for the surface water sample collected downstream of the confluence with Dennis Creek.

5.2.4.2 Sample Results

Up to four inorganic elements were detected in the background surface water samples, ranging in concentration from 2.1 μg/L (arsenic in sample 98BBGC02SW) to 25 μg/L (chromium in sample 98BBGC02SW). The results of the background surface water samples are included in Table 7-3.

6. POTENTIAL SOURCES

This section summarizes the physical characteristics of the potential hazardous substance sources, and describes the locations and analytical results of the samples obtained for the SI. Table 3-1 lists the sample identifications and locations for all samples collected for the SI. The E & E alphanumeric station identification codes are used to identify samples in this section. Laboratory data sheets containing analytical results for the SI samples are contained in Appendix B. Tables 6-1 through 6-4 summarize the results of the source samples collected for the SI.

6.1 SUMMARY OF SOURCE CHARACTERISTICS

Figure 2-2 illustrates the potential sources evaluated for the SI. A discussion of containment factors and source sizes is provided below.

- **Mine Tailings.** The mine tailings are relatively fine (sand to coarse sand in size) and are reddish in color. The quantity of tailings at the site has been previously estimated at 300,000 cubic yards. Interpretation of aerial photography indicates the tailings cover an area of approximately 400,000 square feet (9.2 acres). The tailings piles have no engineered cover or liner, and no run-off or run-on controls exist.
- **Former Mill/Rotary Kiln.** Soils surrounding, within, and underlying the Former Mill/Rotary Kiln represent a source of hazardous substances. The quantity of contaminated soil is unknown, however, the mill structure covers an estimated area of 1,800 square feet. The kiln may also be a source of hazardous substances as the inside of the kiln may be coated with mercury and heavy metals-containing dust. The quantity of hazardous substances associated with the kiln itself is unknown. No engineered run-on or run-off controls exist at the Former Mill/Rotary Kiln, and no liner is known to be present.
- **Mine Adit.** The open mine adit is filled with water which discharges onto the ground surface at an estimated rate of approximately 1 gallon per minute (as observed during the SI). No run-on or run-off controls exist at the mine adit.

6.2 SOURCE SAMPLE RESULTS

Analytical results of the water and soil/waste samples for each source are provided below. Source sample locations are illustrated in Figures 6-1 (Tailings Piles), 6-2 (Former Mill/Rotary Kiln), and 6-3 (Mine Adit).

- **Mine Tailings.** Six surface tailings and six subsurface tailings samples were collected from the Mine Tailings source. Sample locations were selected to provide a representative aerial coverage of both the "upper" and "lower" tailings piles. Sample results for the Mine Tailings are included in Table 6-1.

  Inorganic elements detected at significant concentrations in the Mine Tailings samples include: arsenic (ranging from 239 to 382 mg/kg) and mercury (148 mg/kg). Only one of the mine tailings samples (98BBMT02SB), collected at the "upper" tailings pile, contained a significant concentration of mercury. Inorganic element concentrations in the surface tailings samples were similar to the concentrations detected in the subsurface tailings samples.

- **Former Mill/Rotary Kiln.** Six surface soil samples and four subsurface soil samples were collected from the Former Mill/Rotary Kiln. Sample locations were selected to characterize areas where mercury deposition was likely to have occurred during mill operations. Sample results for the Former Mill/Rotary Kiln are included in Table 6-2.

  Inorganic elements detected at significant concentrations with respect to background in the Former Mill/Rotary Kiln samples include: arsenic (ranging from 114 mg/kg to 952 mg/kg), cadmium (ranging from 0.21 to 1.92 mg/kg), chromium (858 mg/kg), copper (535 mg/kg), lead (ranging from 31.1 to 57.5 mg/kg), mercury (ranging from 91.9 to 54,300 mg/kg), nickel (188 mg/kg), selenium (1.4 mg/kg JL) silver (0.54 mg/kg JL), vanadium (682 mg/kg), and zinc (ranging from 307 to 2,330 mg/kg). All of the samples collected at the former mill/rotary kiln contained significant concentrations of mercury. The highest concentrations of mercury were detected in surface soil samples collected outside of the mill structure.

- **Mine Adit.** One water sample and one sediment sample were collected from the Mine Adit to determine if hazardous substances are being released from underground workings of the mine. Sample results for the Mine Adit are included in Table 6-3(water) and Table 6-4 (sediment).

  Inorganic elements detected at significant concentrations in the Mine Adit water sample include antimony (1.6 μg/L), chromium (18 μg/L), cobalt (11 μg/L), copper (13.5 μg/L), manganese (508 μg/L), and nickel (34 μg/L).

  Inorganic elements detected at significant concentrations in the Mine Adit sediment sample include beryllium (10.8 mg/kg), cobalt (325 mg/kg), copper (967 mg/kg), lead (25.9 mg/kg), manganese (8,320 mg/kg), nickel (168 mg/kg), mercury (adjusted concentration of 11.5 mg/kg), and zinc (297 mg/kg).

Table 6-1

SOURCE TAILINGS SAMPLES
ANALYTICAL RESULTS SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

Sample Location	Background Surface Soil	Upper Tailings-East Surface	Upper Tailings-West Surface	Lower Tailings-West Surface	Lower Tailings-Northwest Surface	Lower Tailings-Center Surface	Lower Tailings-East Surface
E & E Station ID	98BBBG01SS	98BBMT01SS	98BBMT02SS	98BBMT03SS	98BBMT04SS	98BBMT05SS	98BBMT06SS
EPA Sample ID	98364152	98364130	98364131	98364132	98364133	98364134	98364135
Depth (inches bgs)	0-2	0-2	0-2	0-2	0-2	0-2	0-2
Inorganics (mg/kg)							
Aluminum	20600	8000	17000	70000	61700	28700	70700
Antimony	7.7 UJK	R	R	6.5 UJK	13 UJK	R	R
Arsenic	68.5	52	52.9	269	348	109	382
Barium	103	39.7	43.4	10.2	14.6	21.7	23.9
Beryllium	0.972	1.14	0.896	1.13	1.08	0.774	0.919
Calcium	1880	668	1650	427	278	2060	378
Chromium	48.4	22.4	28.5	95.6	79.2	49.1	86.5
Cobalt	21.6	20.6	17.2	16.3	12.4	24	8.77
Copper	84.2	48.3	47.9	97.9	96.4	69.9	109
Iron	50800	76100	41400	57600	59700	41100	45400
Lead	5.11	4.98	9.47	7.24	7.96	5.13	9.59
Magnesium	1510	198	429	415	214	914	257
Manganese	1530	329	446	630	265	800	307
Mercury	15.2	0.383	11.8	2.62	3.44	5.99	1.12
Nickel	29.4	11.8	13.2	35.3	35.4	20.1	24.2
Potassium	305	130	205	75	81	205	70 U
Sodium	75.3	20.2	52.9	143	119	92.9	158
Vanadium	133	219	115	115	117	93.3	120
Zinc	83.8	112	95.2	53.9	35.5	52.2	36.4

Key at the end of table.

Table 6-1

SOURCE TAILINGS SAMPLES
ANALYTICAL RESULTS SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

Sample Location	Background Subsurface Soil	Upper Tailings-East Subsurface	Upper Tailings-West Subsurface	Lower Tailings-West Subsurface	Lower Tailings-Northwest Subsurface	Lower Tailings-Central Subsurface	Lower Tailings-East Subsurface
E & E Station ID	98BBBG01SB	98BBMT01SB	98BBMT02SB	98BBMT03SB	98BBMT04SB	98BBMT05SB	98BBMT06SB
EPA Sample ID	98364154	98364136	98364137	98364138	98364139	98364140	98364141
Depth (inches bgs)	20-24	20-26	16-20	16-20	20-26	14-20	12-18
Inorganics (mg/kg)							
Aluminum	18700	6840	15800	74800	64400	81400	78000
Antimony	4.5 UJK	R	9.0 UJK	R	R	R	11 UJK
Arsenic	69.4	56.7	239	356	338	143	330
Barium	100	16.9	9.26	10.9	17.3	10.2	68
Beryllium	0.973	1.07	0.997	1.1	1.11	1.17	1.02
Calcium	2080	639	249	636	269	948	157
Chromium	45.8	12	52.6	114	79.5	135	84.7
Cobalt	20.8	17.7	13.6	20.6	10.7	34.4	5.8
Copper	79.5	49.7	51.5	120	93.8	118	109
Iron	49000	60100	72800	67400	54000	71500	42800
Lead	4.93	4.11	11.3	11 JK (7.64[a])	7.44	7.3	12.1
Magnesium	1470	156	150	470	173	967	121
Manganese	1470	227	395	635	218	1920	183
Mercury	11.1 JK (20.3[a])	0.11	148	5.44	3.66	2.04	1.18
Nickel	27.6	9.21	26.3	45.4	29.1	47.5	20.9
Potassium	242	110	70 U	100	84	70 U	70 U
Sodium	68.8	19.4	18.5 U	171	122	208	163
Vanadium	130	173	109	130	113	127	128
Zinc	84.7	99.5	44.7	70.3	33.3	99.1	35

[a] Concentration adjusted according to EPA 1996, *Using Qualified Data to Document an Observed Release and Observed Contamination*, EPA 540-F-94-028.

Note: Bold type indicates concentrations above sample quantitation limits or detection limits.
Underlined type indicates result is significant as defined in Section 5.

Key:

bgs = Below ground surface.
EPA = U.S. Environmental Protection Agency.
J = The analyte was positively identified; the associated numerical value is the approximate concentration in the sample.
K = Unknown bias.
L = Low bias.
µg/kg = Milligrams per kilogram.
R = The sample result is rejected due to deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
SI = Site Inspection.
U = The analyte was not detected at the reported sample quantitation limit.

Tabl

SOURCE SOIL SAMPLES
ANALYTICAL RESULTS SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

Sample Location	Background Surface Soil	Outside Mill-East Door	Inside Mill-Near Feeder	Outside Mill-West Door	Outside Mill-East Side Foundation	Outside Mill-Northeast Side	Outside Mill-Northwest Side
E & E Station ID	98BBBG02SS	98BBMK01SS	98BBMK02SS	98BBMK03SS	98BBMK04SS	98BBMK05SS	98BBMK06SS
EPA Sample ID	98364153	98364142	98364143	98364144	98364145	98364146	98364147
Depth (inches bgs)	0-2	0-2	0-2	0-2	0-2	0-2	0-2
Inorganics (mg/kg)							
Aluminum	37900	18400	3420	9420	2370	34900	36200
Arsenic	18.8 JL (32.7*)	270	145	153	952	183	114
Barium	281	21.1	10.3	22.4	3.39	36	82.7
Beryllium	1.29	0.42	0.594	0.568	1.46	0.673	0.769
Cadmium	0.23	0.2 U	0.37	1.92	0.2 U	0.2 U	0.2
Calcium	6440	4250	2390	1940	35.9	3610	2950
Chromium	61.4	51.8	44.3	54	858	62.3	49.3
Cobalt	34	15.5	24.5	23.1	42.7	18.4	12.5
Copper	120	122	137	170	535	138	113
Iron	68600	51000	54400	71300	372000	47800	42800
Lead	9.74	17.6	17.2	57.4	18.6	31.1	57.5
Magnesium	1820	2370	1200	1050	77.1	1460	2210
Manganese	3520	635	1190	1180	426	915	483
Mercury	5.48	2550	1800	2390	54300	359	174
Nickel	28.9	36.7	34.5	39.5	188	31	23
Potassium	1050	74	70 U	70 U	73	258	548
Selenium	0.3 UJL (0.7 U*)	1.4 JL	0.4 UJL	0.4 UJL	0.67 JL	0.4 UJL	0.4 UJL
Silver	0.4 UJL (0.7 U*)	0.4 UJL	0.4 UJL	0.4 JL	0.4 UJL	0.4 UJL	0.4 UJL
Sodium	71.6	109	25.9	46.7	14.1 U	804	542
Thallium	R	R	R	R	R	R	R
Vanadium	184	85.3	92.7	91.8	682	88.8	95.9
Zinc	105	926	1170	2330	29.6	454	276

Key at the end of table.

Table 6-2

SOURCE SOIL SAMPLES
ANALYTICAL RESULTS SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

Sample Location	Background Subsurface Soil	Outside Mill-East Door	Mill Trap Door	Outside Mill-Northeast Side	Outside Mill-Northwest Side
E & E Station ID	98BBBG01SB	98BBMK01SB	98BBMK02SB	98BBMK03SB	98BBMK04SB
EPA Sample ID	98364154	98364148	98364149	98364150	98364151
Depth (bgs)	20-24	10-16	1-7	12-18	12-18
Inorganics (mg/kg)					
Aluminum	18700	29300	27000	46800	41300
Arsenic	69.4	173	102	132	135
Barium	100	53.4	125	20.9	62
Beryllium	0.973	0.588	0.49	0.782	0.842
Cadmium	0.2 U	0.2 U	0.21	0.2 U	0.2 U
Calcium	2080	4920	3600	5430	2540
Chromium	45.8	45.5	44.5	77	57.9
Cobalt	20.8	10.8	9.36	24.9	18.1
Copper	79.5	67.5	75.6	126	153
Iron	49000	35900	72000	53900	54900
Lead	4.93	9.71	34.4	8.6	51.7
Magnesium	1470	2160	1580	3340	1990
Manganese	1470	481	313	1280	675
Mercury	11.1 JK (20.3*)	397	237	91.9	264
Nickel	27.6	26.4	25.7	41	32.7
Potassium	242	370	1080	160	337
Selenium	0.4 UJL (0.7U*)	0.4 UJL	0.4 UJL	0.3 UJL	0.4 UJL
Silver	0.4 UJL (0.7U*)	0.4 UJ	0.54 JL	0.4 UJL	0.4 UJL
Sodium	68.8	109	815	318	166
Thallium	R	R	R	R	R
Vanadium	130	101	69.4	121	114
Zinc	84.7	85.3	244	139	307

* Concentration adjusted according to EPA 1996, *Using Qualified Data to Document an Observed Release and Observed Contamination*, EPA 540-F-94-028.

Note: Bold type indicates concentrations above sample quantitation limits or detection limits.
Underlined type indicates result is significant as defined in Section 5.

Key:

bgs = Below ground surface.
EPA = U.S. Environmental Protection Agency.
J = The analyte was positively identified; the associated numerical value is the approximate concentration in the sample.
K = Unknown bias.
L = Low bias.
mg/kg = Milligrams per kilogram.
R = The sample result is rejected due to deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
SI = Site Inspection.
U = The analyte was not detected at the reported sample quantitation limit.

Table 6-3

SOURCE MINE ADIT WATER SAMPLE ANALYTICAL RESULTS SUMMARY BLACK BUTTE MINE SI COTTAGE GROVE, OREGON

Sample Location	Background Groundwater	Mine Adit Water
E & E Station ID	98BBDW09GW	98BBMA01SW
EPA Sample ID	98364109	98364121
Inorganics (µg/L)		
Aluminum	**74**	**294**
Antimony	0.63 U	**1.6**
Arsenic	**39.9**	**1.3**
Barium	**380**	**25**
Calcium	**32100**	**31400**
Chromium	6.3 U	**18**
Cobalt	6.3 U	**11**
Copper	3.8 U	**13.5**
Iron	**25400**	**95.8**
Lead	**3.69**	**0.23**
Magnesium	**7970**	**14800**
Manganese	**86.7**	**508**
Nickel	13 U	**34**
Potassium	**1500**	0.037 U
Silver	**0.048**	880 U
Sodium	**27000**	**2150**
Zinc	**206**	**22**

Note: Bold type indicates concentrations above sample quantitation limits or detection limits. Underlined type indicates result is significant as defined in Section 5.

Key:

EPA = U.S. Environmental Protection Agency.
µg/L = Micrograms per liter.
SI = Site Inspection
U = The analyte was not detected at the reported sample quantitation limit.

Table 6-4

SOURCE MINE ADIT SEDIMENT SAMPLE ANALYTICAL RESULTS SUMMARY BLACK BUTTE MINE SI COTTAGE GROVE, OREGON

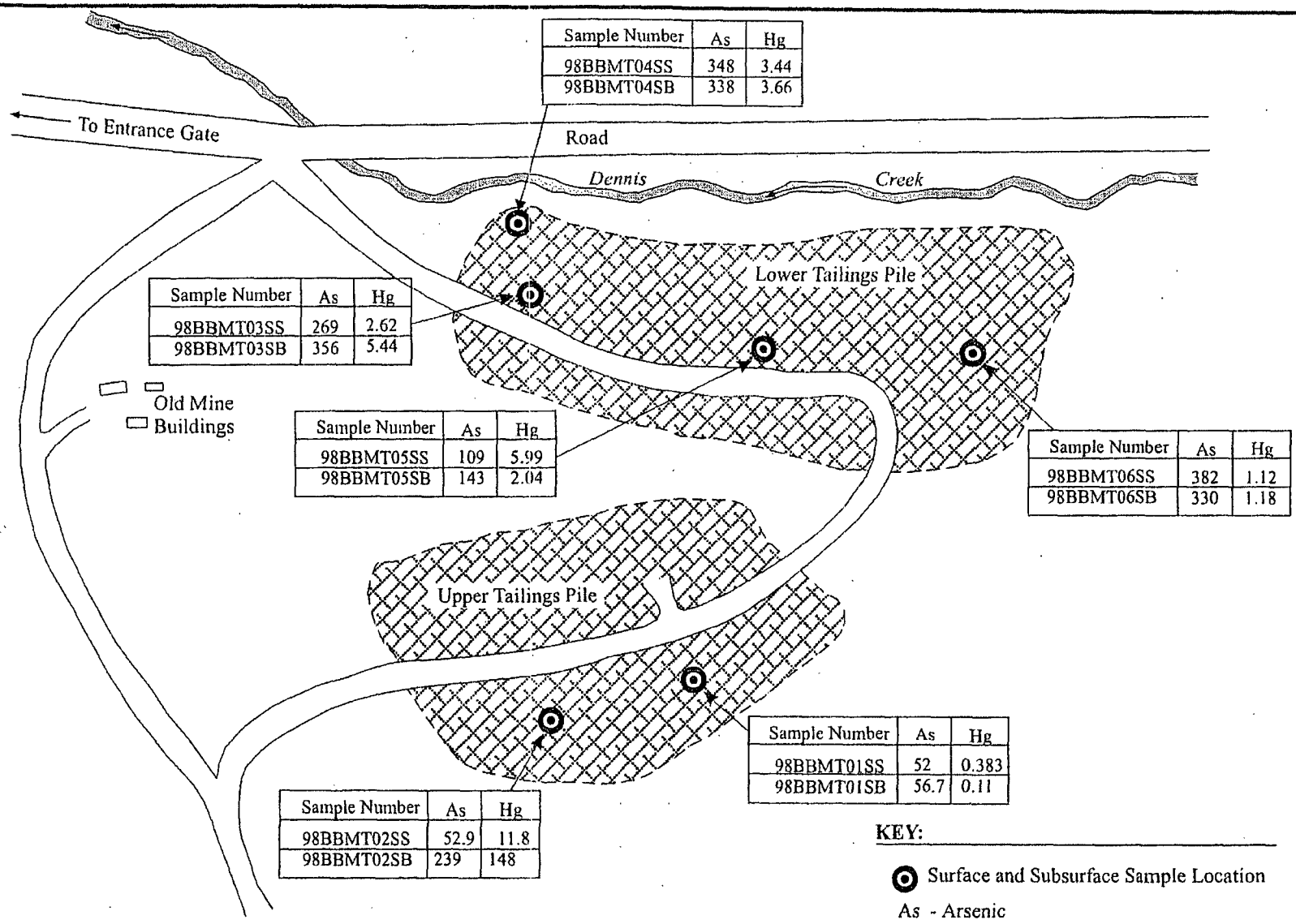
Sample Location	Background Sediment	Mine Adit Sediment
E & E Station ID	98BBDC05SD	98BBMA01SD
EPA Sample ID	98364128	98364129
Depth (inches bgs)	0-2	0-2
Inorganics (mg/kg)		
Aluminum	**20200**	**84000**
Antimony	R	R
Arsenic	**79.5**	**50.8**
Barium	**113**	**114**
Beryllium	**0.85**	**10.8**
Calcium	**4600**	**2210**
Chromium	**45.4**	**88.8**
Cobalt	**20.6**	**325**
Copper	**71.7**	**967**
Iron	**47900**	**41900**
Lead	**3.27**	**25.9**
Magnesium	**3820**	**593**
Manganese	**1160**	**8320**
Mercury	**1.41 JH**	**21 JH (11.5[a])**
Nickel	**23.5**	**168**
Potassium	**410**	**380**
Sodium	**211**	**39.6**
Vanadium	**114**	**119**
Zinc	**72.6**	**297**

[a] Concentration adjusted according to EPA 1996, *Using Qualified Data to Document an Observed Release and Observed Contamination*, EPA 540-F-94-028.

Note: *Bold type indicates concentrations above sample quantitation limits or detection limits.*
Underlined type indicates result is significant as defined in Section 5.

Key:

bgs = Below ground surface.
EPA = U.S. Environmental Protection Agency.
H = High bias.
J = The analyte was positively identified; the associated numerical value is the approximate concetration in the sample.
K = Unknown bias.
L = Low bias.
mg/kg = Milligrams per kilogram.
R = The sample result is rejected due to deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
SI = Site Inspection.
U = The analyte was not detected at the reported sample quantitation limit.



Sample Number	As	Hg
98BBMT04SS	348	3.44
98BBMT04SB	338	3.66

Sample Number	As	Hg
98BBMT03SS	269	2.62
98BBMT03SB	356	5.44

Sample Number	As	Hg
98BBMT05SS	109	5.99
98BBMT05SB	143	2.04

Sample Number	As	Hg
98BBMT06SS	382	1.12
98BBMT06SB	330	1.18

Sample Number	As	Hg
98BBMT01SS	52	0.383
98BBMT01SB	56.7	0.11

Sample Number	As	Hg
98BBMT02SS	52.9	11.8
98BBMT02SB	239	148

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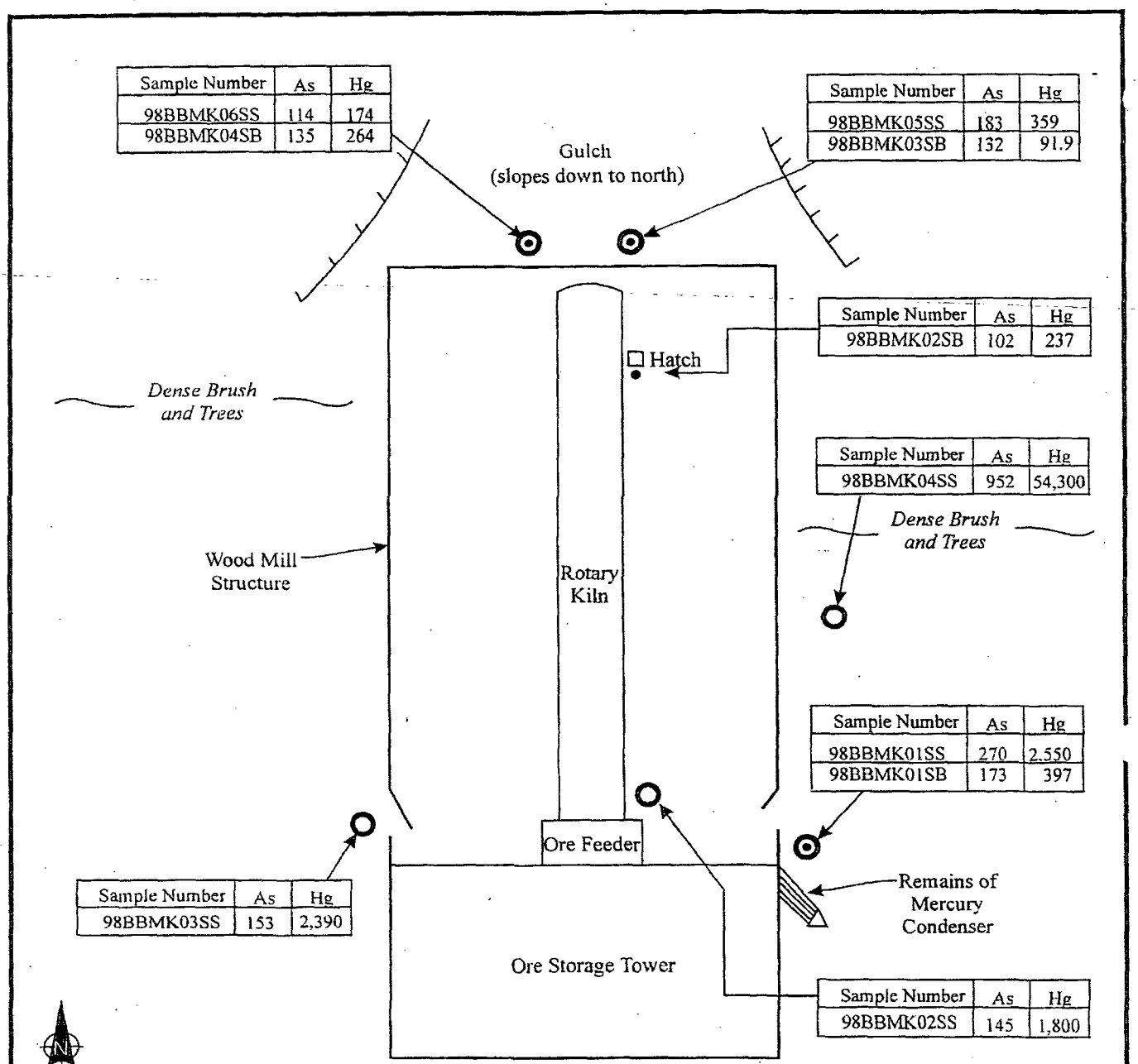
Seattle, Washington

BLACK BUTTE MINE SI
Cottage Grove, Oregon

0 75 150
Approximate Scale in Feet

Figure 6-1
TAILINGS PILES
SAMPLE LOCATION MAP

Drawn:	Date	Job No.	Dwg.No.
AES	2/24/99	CD0401SIT0	CD0401 6-1



KEY:

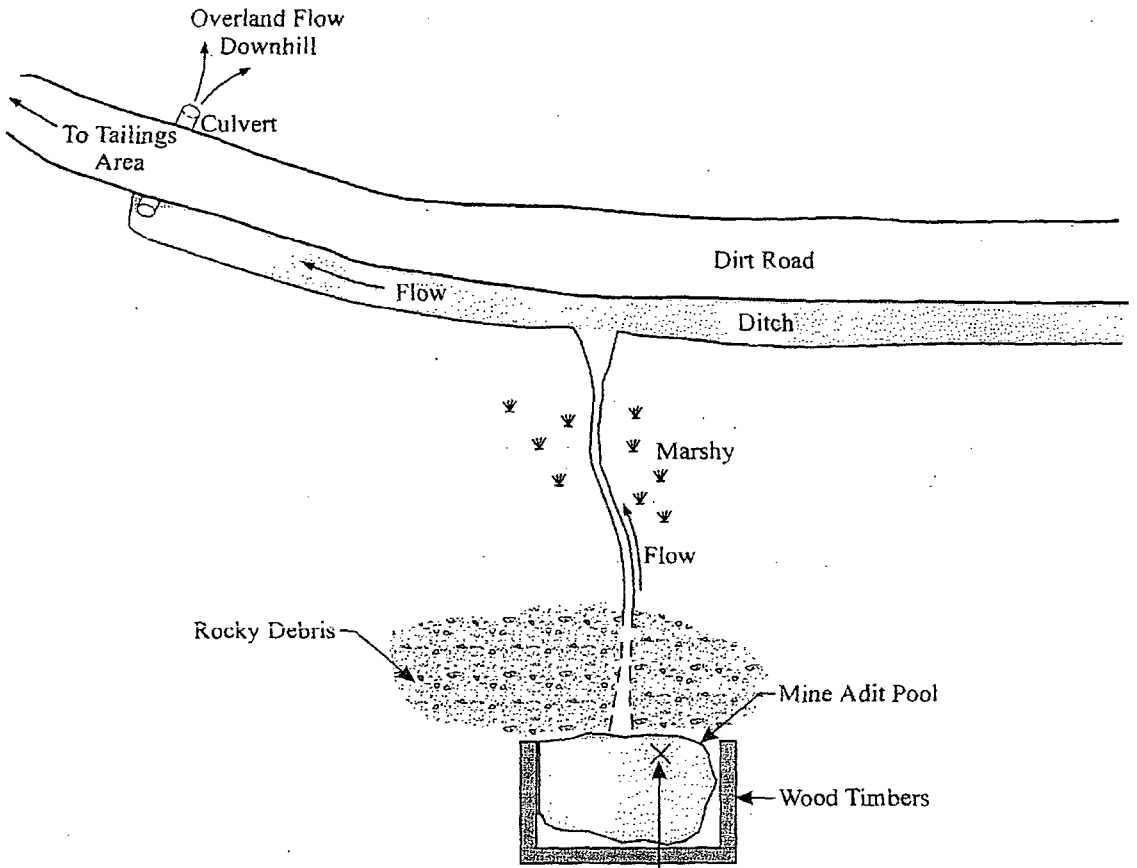
- Surface Soil Sample Location
- Surface and Subsurface Sample Location
- Subsurface Sample Location

As Arsenic

Hg Mercury

NOTE: Listed concentrations are in units of mg/kg

ecology and environment, inc. International Specialists in the Environment Seattle, Washington	BLACK BUTTE MINE SI Cottage Grove, Oregon	Figure 6-2 FORMER MILL/ROTARY KILN SAMPLE LOCATION MAP			
recycled paper	0 5 10 Approximate Scale in Feet	Drawn: AES	DATE: 4/28/99	JOB NO. CD0401S1T0	Dwg.No. CD0401 6-2



Sample Number	As	Hg
98BBMA01SW	1.3	U
98BBHA01SD	50.8	11.5[a]

KEY:

× Location of Samples 98BBMA01SW and 98BBMA01SD
As - Arsenic
Hg - Mercury
U - Analyte undetected
[a] - Adjusted concentration

NOTE: Listed concentrations are in units of mg/kg (sediment) and µg/L (water).

ecology and environment, inc. International Specialists in the Environment Seattle, Washington	BLACK BUTTE MINE SI Cottage Grove, Oregon	Figure 6-3 MINE ADIT SAMPLE LOCATION MAP			
	Not to Scale	Drawn: AES	DATE: 2/24/99	JOB NO. CD0401SIT0	Dwg.No. CD0401 6-3

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7. MIGRATION PATHWAYS AND TARGETS

This section addresses the groundwater migration pathway and the overland flow/flood migration component of the surface water migration pathway. Included in this section are descriptions of the physical characteristics and targets associated with each migration pathway, and the analytical results of the samples collected to characterize each pathway. The air migration and soil exposure pathways were not evaluated for the SI.

7.1 GROUNDWATER MIGRATION PATHWAY

This section discusses pathway characteristics (Section 7.1.1), summarizes targets (Section 7.1.2), and provides groundwater sample results (Section 7.2.3).

7.1.1 Pathway Characteristics

The geology of the Black Butte area consists of andesitic lavas, tuffs, and breccias of the Calapooya Formation (Tertiary). These volcanic rocks have been injected by dikes and intrusive masses of basalt and andesite. Hydrothermal solutions rising along faults within the formation have created altered rock zones composed of carbonates and clay minerals. Cinnabar (mercury ore) occurs in faults along the altered bedrock zones (Brooks 1971).

In the mine area, reddish-brown clay and silty clay overlies the bedrock. The depth to bedrock varies according to slope steepness but generally ranges between 4 and 10 feet. In the flood plains of Garoutte Creek and the Coast Fork of the Willamette River, unconsolidated alluvial deposits of gravelly clays and silts form a relatively thicker horizon (greater than 30 feet) over bedrock (USDA 1987).

Based on a review of drilling logs of water wells, groundwater in the site vicinity occurs within the bedrock of the Calapooya Formation. The drilling logs indicate water wells near the site range in total depth between 35 and 120 feet below ground surface (bgs) and have yields ranging from 25 to 80 gallons per minute. Static water levels in domestic wells near the site range from 19 feet bgs to over 100 feet bgs. None of the logs reviewed indicated the presence of groundwater in unconsolidated alluvial deposits with sufficient yield for a water well within at least 1 mile of the site (OWRD various dates). Therefore, all wells within the site's target distance limit (TDL) are assumed to be completed in the same aquifer, which occurs in the bedrock underlying the alluvial deposits. The groundwater flow direction at and near the site is not documented. However, groundwater flow in the bedrock aquifer at the mine site

is assumed to be toward Dennis Creek. Flow direction in the Garoutte Creek floodplain (the location of most water wells near the site) is assumed to be northward towards Cottage Grove Reservoir, which is consistent with regional groundwater flow gradients (ODEQ 1996).

7.1.2 Summary of Targets

Figure 7-1 illustrates the target distance limit for the groundwater migration pathway. Approximately 64 domestic water wells are located within 4 miles of the site (OWRD 1998). The majority of these wells are located in the floodplain of Garoutte Creek and the Coast Fork of the Willamette River. In addition, at least one spring in the site vicinity (within 0.25 mile) is used for drinking purposes ((b) (6) spring; E & E 1998a). The nearest well to the site is located approximately 0.5 miles to the northwest from the mine tailings area of the site. The (b) (6) spring is located within 0.25 miles of the tailings area. The average number of persons per household for Lane County is 2.49, based on the 1990 census (USCB 1999). Table 7-1 summarizes the groundwater population for the site vicinity, based partly on the county household average population data and on survey information collected during the SI fieldwork.

No public groundwater supply systems exist within 4 miles of the site (OWRD 1998).

7.2.3 Groundwater Pathway Sample Results

Ten groundwater samples, including 8 wells and two springs, were collected from locations hydraulically downgradient of the mine (Figure 7-2). The background well is located 1 mile northeast of the site in the Big River valley. Sample results for the groundwater samples are included in Table 7-2.

Inorganic elements detected at elevated concentrations in the groundwater samples include arsenic in two wells, ranging from 93.9 μg/L at the (b) (6) Well to 94.9 μg/L at the (b) well, chromium in two wells ranging from 28.2 μg/L at the (b) (6) well to 30.2 μg/L at the (b) (6) well, copper in three wells ranging from 3.8 μg/L at the (b) (6) well to 14.2 μg/L at the (b) well, lead in two wells ranging from 3.69 at the on-site well to 4.55 μg/L at the (b) (6) well, nickel in two wells ranging from 13 μg/L at the (b) (6) well to 18 μg/L at the (b) (6) well, and selenium two wells ranging from 1.6 μg/L at the (b) (6) well to 3 μg/L at the (b) (6) well.

The (b) (6) well, on-site spring, and the (b) spring did not contain elevated concentrations of inorganic elements. Mercury was not detected at elevated concentrations in any of the groundwater samples. Arsenic was the only contaminant detected in groundwater that exceeded primary maximum contaminant levels (MCLs) for drinking water. The arsenic MCL was exceeded in three domestic wells (b) (6) and (b) (6) .

7.2 SURFACE WATER MIGRATION PATHWAY

This section discusses pathway characteristics (Section 7.2.1), summarizes targets (Section 7.2.2), and provides surface water pathway results (Section 7.2.3).

7.2.1 Pathway Characteristics

Figure 7-3 illustrates the extent of the 15-mile surface water TDL for Black Butte Mine. Two primary probable points of entry (PPEs) for sources at the site to the surface water migration pathway were established in the Dennis Creek drainage. The PPEs include:

- A PPE associated with the mine tailings located at the northwest base of the "lower" tailings pile (PPE1). This PPE corresponds to sample location 98BBDC03SW/SD; and
- A PPE associated with an intermittent tributary entering Dennis Creek that may receive overland runoff from the Former Mill/Rotary Kiln and Mine Adit areas (PPE2). This PPE corresponds to sample location 98BBDC04SW/SD.

PPE2 is located approximately 1,500 feet east (upstream) of PPE1. From PPE1, Dennis Creek flows westward approximately 1,160 (0.22 miles) to the confluence of Dennis Creek and Garoutte Creek. The surface water TDL continues downstream from PPE1 and includes Dennis Creek below the mine to Garoutte Creek, Garoutte Creek to its confluence with Big River, the Coast Fork of the Willamette River to Cottage Grove Reservoir, Cottage Grove Reservoir, and a 2.4 mile section of the Coast Fork of the Willamette River downstream of Cottage Grove Reservoir.

Stream flow is not measured on Dennis Creek; however, its flow during the SI fieldwork was estimated at 0.25 cubic feet per second (CFS; E & E 1998). Stream flow data for Garoutte Creek is not available. Stream flow on the Coast Fork of the Willamette River near the town of London, approximately 4 miles downstream of Dennis Creek, had an average flow of 35.8 CFS between November 1986 and November 1987. Cottage Grove Reservoir is a dammed section of the Coast Fork of the Willamette River, and therefore is considered a slow moving river for the purposes of this report. Stream flow on the Coast Fork of the Willamette River below the Cottage Grove Reservoir Dam had an average flow of 53.4 CFS between September 1996 and September 1997 (OWRD 1998).

The Black Butte Mine receives approximately 55 inches of total precipitation annually, based on records collected near London Springs between 1961 and 1990 (OCS 1998). The 2-year 24-hour rainfall event for the site area is 0.30 inches (USDC 1973). The site is not situated in either the 100- or 500-year floodplains (FEMA 1985).

7.2.2 Summary of Targets

No recorded surface water rights currently exist on Dennis Creek, Garoutte Creek, the Coast Fork of the Willamette River, or Cottage Grove Reservoir are within the site's 15-mile TDL (OWRD 1999).

Dennis Creek does not support any fish populations; however, Garoutte Creek supports a population of Cutthroat trout. Fishing activity on Garoutte Creek occurs in the area of its confluence with Dennis Creek and downstream into the Coast Fork of the Willamette River (Hagedorn 1998). Harvest statistics are not available for Garoutte Creek or the Coast Fork of the Willamette River. Cottage Grove Reservoir is a popular sport fishery; however, no harvest statistics are available (Hagedorn 1998).

According to the Oregon Natural Heritage Program (ONHP) site area is used by several species of potential concern (ONHP 1999). These species include the following:

- Oregon chub (state endangered species),
- Bald eagle (federal threatened species), and
- Northern spotted owl (federal threatened species).

The ONHP could not provide detailed locations for the habitats used by these species, however, ONHP staff indicated that their presence within 4 miles of the site is confirmed. No other sensitive environments are known to exist downstream of the site.

The nearest wetlands to the site are Palustrine Forested and Palustrine Emergent wetlands exist along the Coast Fork of the Willamette River, starting approximately 1.9 miles downstream of the site. These types of wetlands meet the definition of wetlands set forth in 40 CFR 230.3. Wetlands front the river for approximately 4.7 miles to Cottage Grove Reservoir (9.4 miles of total wetland frontage). Cottage Grove Reservoir is bordered by Palustrine Emergent wetlands in several locations, with wetland frontage of approximately 1.7 miles along the lake. No additional wetlands exist within the TDL along the Coast Fork of the Willamette River downstream of Cottage Grove Reservoir (NWI 1974).

7.2.3 Surface Water Pathway Sample Results

Analytical results of the surface water and sediment samples used to evaluate the overland flow/flood migration component are summarized below by surface water body. References to data summary tables for the analytical results are included in each of the subsections below.

- **Dennis Creek.** Five collocated surface water and sediment samples were collected from Dennis Creek (Figure 7-4). The background samples for the Dennis Creek samples are

98BBDC05SW (surface water) and 98BBDC05SD (sediment). Sample results for the Dennis Creek samples are included in Tables 7-3 (surface water) and 7-4 (sediment).

Inorganic elements which were detected at elevated concentrations in the Dennis Creek surface water samples include antimony (1.1 μg/L at the mouth of Dennis Creek), chromium (47 μg/L at the mouth of Dennis Creek), copper (3.9 μg/L at the mouth of Dennis Creek), lead (0.2 μg/L at two locations including the intermittent tributary confluence and a location downstream of the mine road), and nickel (22 μg/L at the mouth of Dennis Creek). The elevated concentration of copper at the intermittent tributary was the only elevated concentration detected in surface water at a PPE.

Mercury was the only inorganic element detected at an elevated concentration in the Dennis Creek sediment samples. Mercury concentrations ranged from an adjusted concentration of 0.667 mg/kg at the intermittent tributary PPE to an adjusted concentration of 26.23 mg/kg at the PPE located below the "lower" tailings pile.

- **Garoutte Creek.** Two collocated surface water and sediment samples were collected from Garoutte Creek (Figure 7-4). The background samples for the Garoutte Creek samples are 98BBGC02SW (surface water) and 98BBGC02SD (sediment). Sample results for the Garoutte Creek samples are included in Tables 7-3 (surface water) and 7-4 (sediment).

  Inorganic elements which were detected at elevated concentrations in the Garoutte Creek surface water sample include: lead (0.14 μg/L), and nickel (21 μg/L).

  No inorganic elements were detected at elevated concentrations in the Garoutte Creek sediment sample collected downstream of the confluence with Dennis Creek.

Table 7-1

GROUNDWATER POPULATION SUMMARY
BLACK BUTTE MINE
COTTAGE GROVE, OREGON

Distance (miles)	Identification of Domestic Wells/Springs	Population served per well	Total Population Served
On a source	(1) On-site well	0	
	(1) On-site spring	0	0
0 - 1/4	(1)(b) (6) Spring	3	3
1/4 - 1/2	(1) Well	5	5
1/2 - 1	(1) (b) (6) ell	2	
	(1) Vell	3	
	(1) Vell	5	
	(1) Vell	1	
	(1) Well	4	
	(10) Domestic Wells	25	40
1 - 2	(1)(b) (6) Well	1	
	(1) (b) Well	4	
	(1) Domestic Well	2	7
2 - 3	(9) Domestic Wells	22	22
3 - 4	(35) Domestic Wells	87	87
		Total	164

Source: Oregon Water Resources Deparment, 1999; E&E 1998a.

recycled paper

Table 7-2

GROUNDWATER SAMPLES
ANALYTICAL RESULTS SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

Sample Location	Background (b) (6) well)	(b) Well	(b) Well	(b) Well	(b) Well	(b) (6) Well	(b) Well	Drinking Water Standard
E & E Station ID	98BBDW09GW	98BBDW01GW	98BBDW02GW	98BBDW03GW	98BBDW04GW	98BBDW05GW	98BBDW06GW	
EPA Sample ID	98364109	98364100	98364101	98364102	98364103	98364104	98364105	
Depth (feet bgs)	92	Unknown	Unknown	Unknown	70	Unknown	125	
Inorganics (µg/l)								
Aluminum	45	25 U	89	386	73	63	44	200 [a]
Arsenic	30.5	2.3	2.5	3.8	93.9	32.2	94.9	50 [b]
Barium	93.8	10.6	55.5	5.7	274	30.6	1.8	2,000 [b]
Calcium	47100	15800	31600	18000	16800	4920	1030	NE
Chromium	8.1	6.3 U	30.2	28.2	21	17	6.7	100 [b]
Copper	3.8 U	3.8	3.8 U	6.6	3.8 U	3.8 U	14.2	1,300 [c]
Iron	632	71.5	131	4130	273	245	27.9	300 [a]
Lead	0.50	4.55	0.3	0.97	0.13 U	0.13 U	0.81	15 [c]
Magnesium	5290	4270	7640	2950	3560	1110	144	NE
Manganese	91.3	10.6	3.5	34.6	4.7	58	2.8	50 [a]
Nickel	13 U	13 U	13	18	13 U	13 U	13 U	600 [d]
Potassium	1100	880 U	880 U	880 U	2520	880 U	880 U	NE
Selenium	1.3 U	1.3 U	1.3 U	1.3 U	1.6	1.3 U	1.3 U	50 [b]
Silver	0.37 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	100 [a]
Sodium	26700	6780	10600	7140	301000	62600	73900	20,000 [d]
Zinc	124	9.1	6.3	14	5 U	5 U	12	5,000 [a]

Key at the end of table.

Table 7-2

GROUNDWATER SAMPLES
ANALYTICAL RESULTS SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

Sample Location	Background (b) (6) well)	On-Site Spring	(b) Well	On-Site Well	(b) Spring	Drinking Water Standard
E & E Station ID	98BBDW09GW	98BBDW07GW	98BBDW08GW	98BBDW10GW	98BBSP01GW	
EPA Sample ID	98364109	98364106	98364107	98364109	98364112	
Depth (bgs)	92	NA	82	150	NA	
Inorganics (µg/L)						
Aluminum	45	38	41	74	126	200 [a]
Arsenic	30.5	2.7	66.7	39.9	3.5	50 [b]
Barium	93.8	12.2	672	380	12.6	2,000 [b]
Calcium	47100	11700	51800	32100	11800	NE
Chromium	8.1	6.3 U	9.4	6.3 U	11	100 [b]
Copper	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	1,300 [c]
Iron	632	182	1100	25400	311	300 [a]
Lead	0.50	0.99	0.13 U	3.69	0.16	15 [c]
Magnesium	5290	2730	9340	7970	2730	NE
Manganese	91.3	20.1	92.9	86.7	26.1	50 [a]
Nickel	13 U	13 U	13 U	13 U	13 U	600 [d]
Potassium	1100	880 U	3390	1500	880 U	NE
Selenium	1.3 U	1.3 U	3	1.3 U	1.3 U	50 [b]
Silver	0.37 U	0.037 U	0.037 U	0.048	0.037 U	100 [a]
Sodium	26700	4770	288000	27000	4800	20,000 [d]
Zinc	124	91.2	7.9	206	11	5,000 [a]

[a] Secondary maximum contaminant level.
[b] Primary maximum contaminant level.
[c] Drinking water action level at tap.
[d] Drinking water equivalent level.

Note: Bold type indicates concentrations above sample quantitation limits or detection limits.
Underlined type indicates result is elevated as defined in Section 5.

Key:

EPA = U.S. Environmental Protection Agency.
µg/L = Micrograms per liter.
NE = No standard exists.
SI = Site Inspection.
U = The analyte was not detected at the reported sample quantitation limit.

Table

SURFACE WATER SAMPLES
ANALYTICAL RESULTS SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

Sample Location	Dennis Creek Background	Dennis Creek at Tributary	Dennis Creek Below Tailings	Dennis Creek Below Mine Road	Dennis Creek at Mouth	Garoutte Creek Background	Garoutte Creek Below Dennis Creek
E & E Station ID	98BBDC05SW	98BBDC04SW	98BBDC03SW	98BBDC02SW	98BBDC01SW	98BBGC02SW	98BBGC01SW
EPA Sample ID	98364119	98364118	98364117	98364116	98364114	98364115	983641113
Inorganics (µg/L)							
Aluminum	**66**	**304**	**35**	**37**	**175**	**120**	**186**
Antimony	0.63 U	0.63 U	56 U	0.63 U	**1.1**	0.63 U	0.63 U
Arsenic	**2.5**	**2.6**	**1.7**	**0.86**	**2.5**	**2.1**	**2.4**
Barium	**11.3**	**28.4**	**31.1**	**30.8**	**24.5**	**7**	**8.56**
Beryllium	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Calcium	**12400**	**36600**	**44400**	**45300**	**40000**	**12800**	**13300**
Chromium	6.3 U	6.3 U	6.3 U	6.3 U	**47**	**25**	**33.1**
Cobalt	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U
Copper	3.8 U	3.8 U	3.8 U	3.8 U	**3.9**	3.8 U	3.8 U
Iron	**259**	**570**	**82.4**	**57.6**	**244**	**232**	**332**
Lead	0.13 U	**0.13**	0.13 U	**0.2**	0.13 U	0.13 U	**0.14**
Magnesium	**3120**	**8450**	**10300**	**10600**	**9850**	**2790**	**2930**
Manganese	**21.1**	**33.5**	**12.2**	**10.9**	**13.1**	**9.68**	**16.3**
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	13 U	13 U	13 U	13 U	**22**	13 U	**21**
Potassium	880 U	880 U	880 U	880 U	880 U	880 U	880 U
Sodium	**5210**	**5050**	**4840**	**4980**	**5160**	**5150**	**5090**
Vanadium	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Zinc	5 U	5 U	5 U	5 U	5 U	5 U	5 U

Note: Bold type indicates concentrations above sample quantitation limits or detection limits.
Underlined type indicates result is elevated as defined in Section 5.

Key:

bgs = Below ground surface.
EPA = U.S. Environmental Protection Agency.
H = High bias.
J = The analyte was positively identified; the associated numerical value is the approximate concentration in the sample.
L = Low bias.
µg/L = Micrograms per kilogram.
R = The sample result is rejected due to deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
SI = Site Inspection.
U = The analyte was not detected at the reported sample quantitation limit.

Table 7-4

SEDIMENT SAMPLES
ANALYTICAL RESULTS SUMMARY
BLACK BUTTE MINE SI
COTTAGE GROVE, OREGON

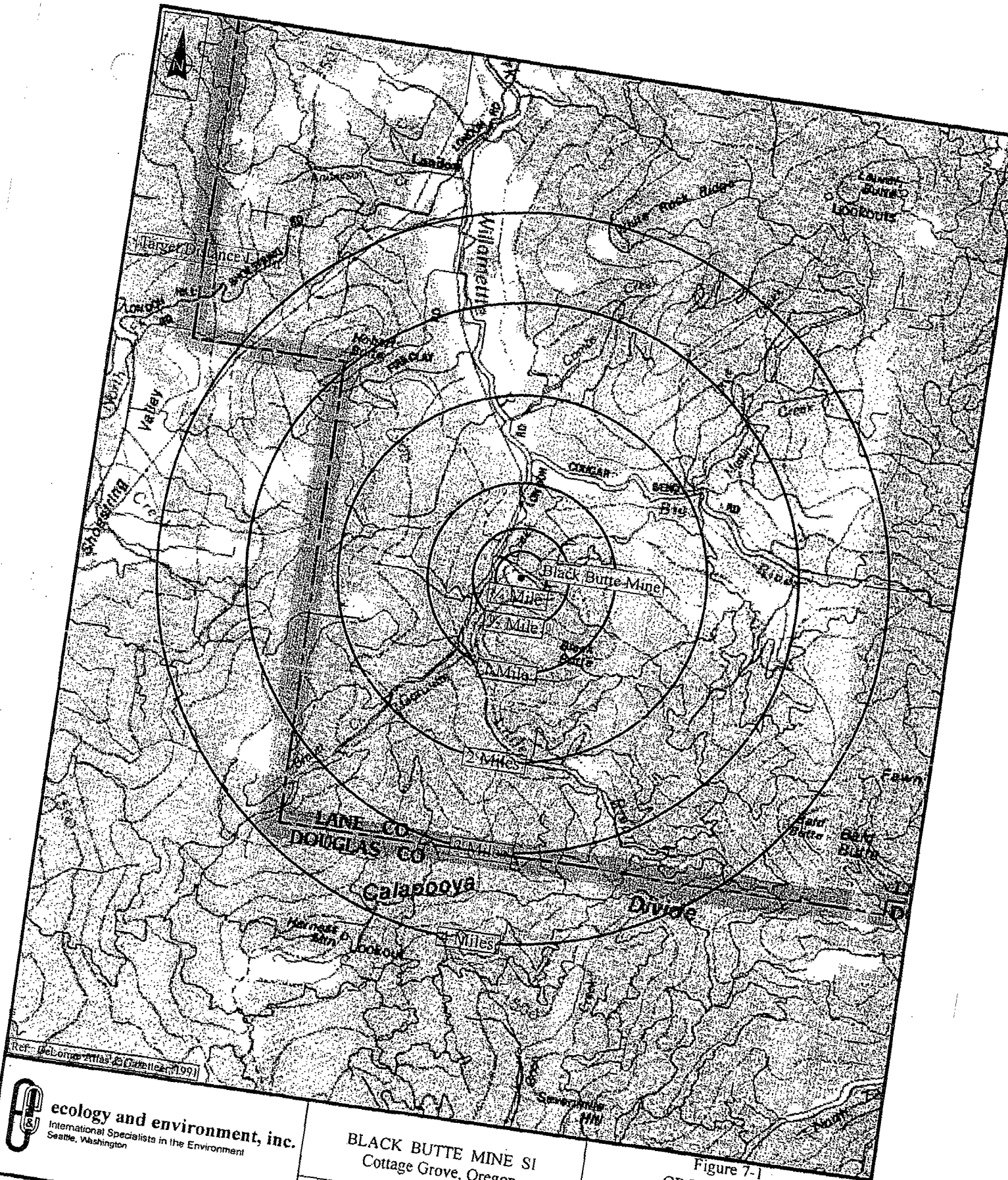
Sample Location	Dennis Creek Background	Dennis Creek Tributary	Dennis Creek Below Tailings	Dennis Creek Below Mine Road	Dennis Creek at Mouth	Garoutte Creek Background	Garoutte Creek Below Dennis Creek
E & E Station ID	98BBDC05SD	98BBDC04SD	98BBDC03SD	98BBDC02SD	98BBDC01SD	98BBGC02SD	98BBGC01SD
EPA Sample ID	98364122	98364127	98364126	98364125	98364123	98364124	98364122
Depth (inches bgs)	0-2	0-2	0-2	0-2	0-2	0-2	0-2
Inorganics (mg/kg)							
Aluminum	20200	17300	15100	16600	19100	21500	15500
Antimony	R	R	R	R	R	R	R
Arsenic	79.5	66.7	63.9	55.5	66.6	33.9	26.8
Barium	113	115	104	98.4	86.1	94.8	80.9
Beryllium	0.850	0.802	0.948	0.792	0.905	0.882	0.811
Calcium	4600	4630	3990	3750	3680	5980	5220
Chromium	45.4	38.7	47.2	35.6	45.4	38.1	42.9
Cobalt	20.6	21.5	25	27.8	24.2	17.6	17.4
Copper	71.7	66.2	65.1	64.9	68.9	73.8	62.9
Iron	47900	42900	61100	43300	55800	51900	46000
Lead	3.27	3.17	3.14	4.57	3.58	2.76	2.65
Magnesium	3820	3700	2620	2830	2980	5700	4820
Manganese	1160	1190	1260	1230	2260	877	844
Mercury	0.978 JH	1.22 JH (0.667[a])	48 JH (26.23[a])	5.61 JH (3.07[a])	3.85 JH (2.10[a])	0.932 JH	0.978 JH (0.534[a])
Nickel	23.5	21.2	27.1	23.7	30.7	19.4	21.1
Potassium	410	313	339	322	401	437	307
Sodium	211	180	188	143	262	362	267
Vanadium	114	98.9	135	97.5	111	145	150
Zinc	72.6	69.6	83.6	66.3	76.8	88	95.6

[a] Concentration adjusted according to EPA 1996. *Using Qualified Data to Document an Observed Release and Observed Contamination*, EPA 540-F-94-028.

Note: Bold type indicates concentrations above sample quantitation limits or detection limits.
Underlined type indicates result is elevated as defined in Section 5.

Key:

bgs = Below ground surface.
EPA = U.S. Environmental Protection Agency.
H = High bias.
J = The analyte was positively identified; the associated numerical value is the approximate concentration in the sample.
L = Low bias.
mg/kg = Milligrams per kilogram.
R = The sample result is rejected due to deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
SI = Site Inspection.
U = The analyte was not detected at the associated sample quantitation limit.



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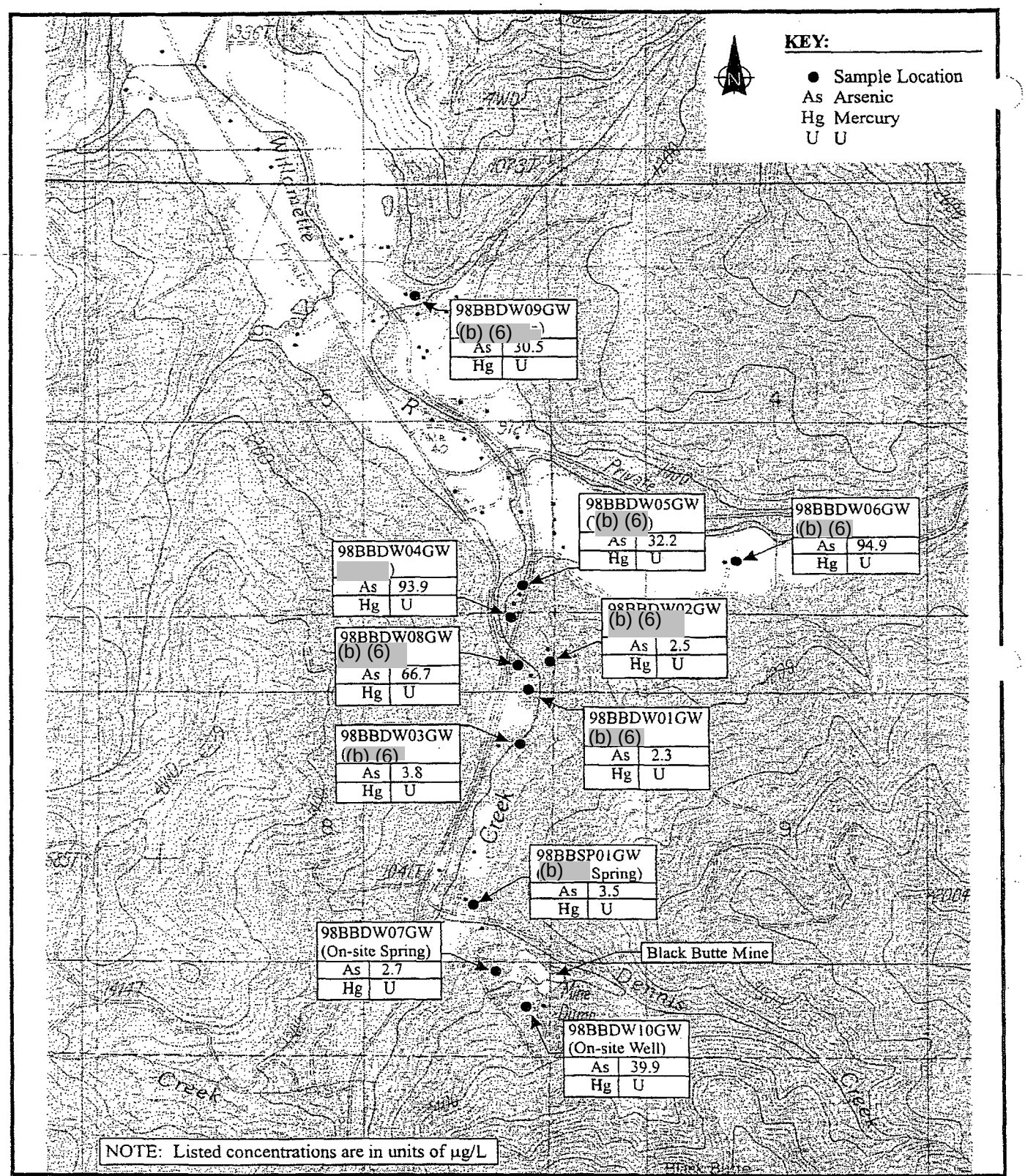
Seattle, Washington

BLACK BUTTE MINE SI
Cottage Grove, Oregon

0 1 2
Approximate Scale in Miles

Figure 7-1
GROUNDWATER
MIGRATION PATHWAY
TARGET DISTANCE LIMIT MAP

Drawn:	DATE:	JOB NO.	Dwg.No.
AES	2/24/99	CD0401SIT0	CD0401 7-1



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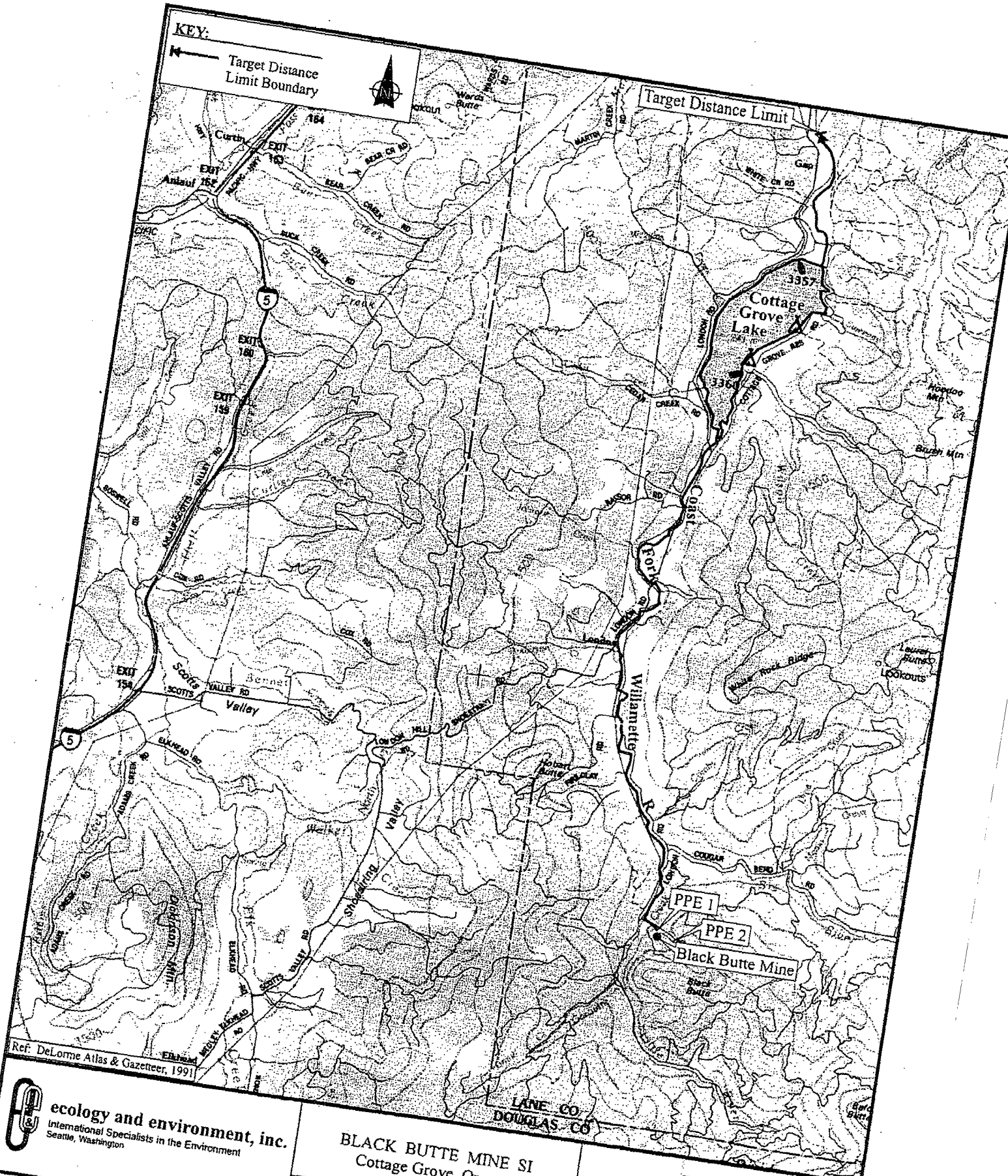
Seattle, Washington

BLACK BUTTE MINE SI
Cottage Grove, Oregon

0 .25 .5
Approximate Scale in Miles

Figure 7-2
GROUNDWATER
SAMPLE LOCATION MAP

Drawn:	DATE:	JOB NO.	Dwg.No.
AES	2/24/99	CD0401SIT0	CD0401 7-2



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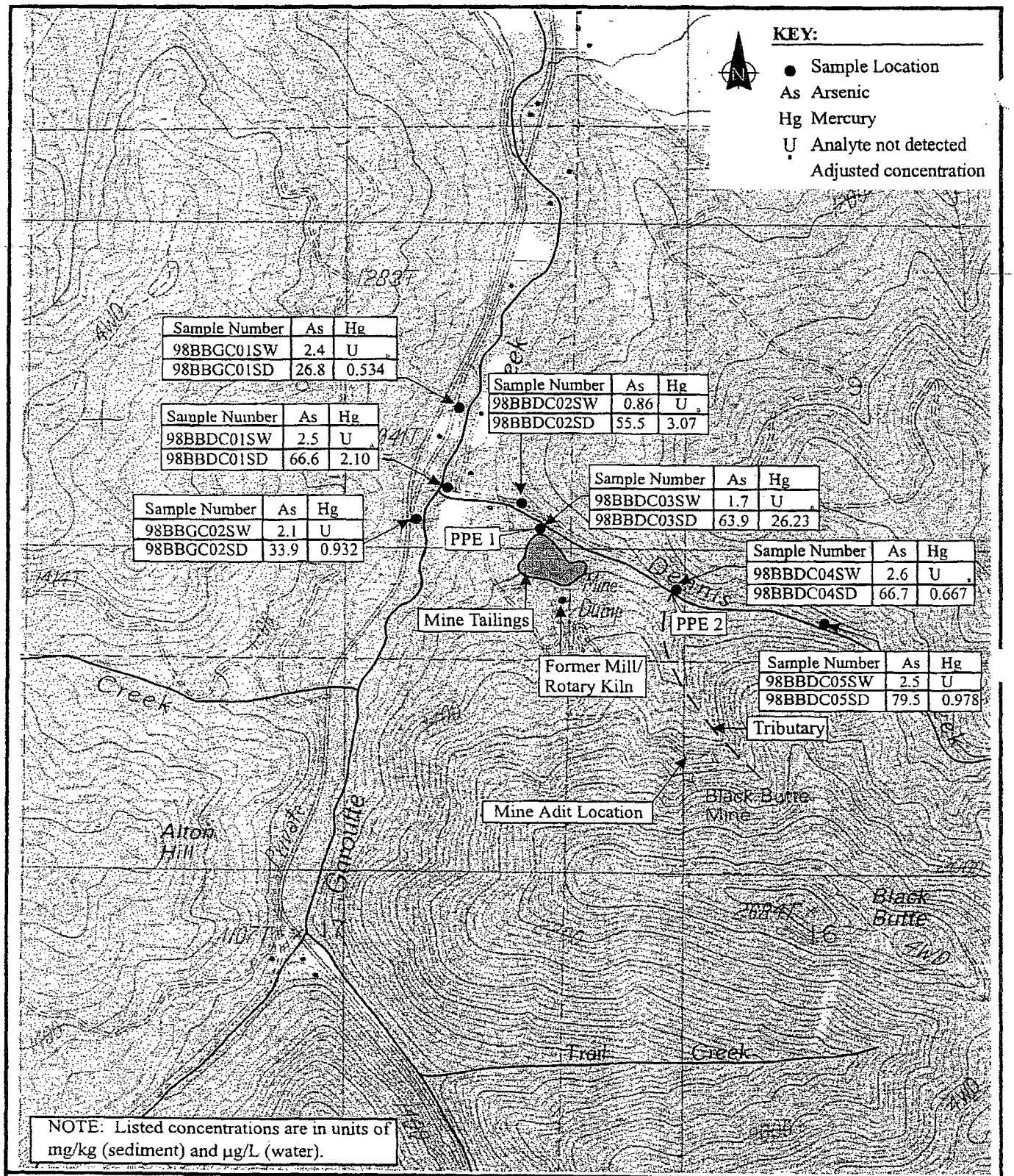
BLACK BUTTE MINE SI
Cottage Grove, Oregon

0 1 2
Approximate Scale in Miles

Figure 7-3
15-MILE MAP

Drawn:	DATE:	JOB NO.	Dwg.No.
AES	3/26/99	CD0401SIT0	CD0401 7-3



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International Specialists in the Environment
Seattle, Washington

BLACK BUTTE MINE SI
Cottage Grove, Oregon

0 .25 .5
Approximate Scale in Miles

Figure 7-4
SURFACE WATER/SEDIMENT SAMPLE LOCATION MAP

Drawn:	DATE:	JOB NO.	Dwg.No.
AES	4/28/99	CD0401SIT0	CD0401 7-4

8. SUMMARY AND CONCLUSIONS

8.1 SUMMARY

In August 1998, START conducted an SI at the Black Butte Mine located near Cottage Grove, Oregon. The mine is a former mercury mine which operated between the 1890s and 1970s. The major site features currently at the site include tailings piles, a mill building which houses a rotary kiln and mercury condenser, an open mine adit, and old mine buildings and debris. The mine was operated by a series of different mining companies throughout the mine's operational years. The current owner of the mine property is the Land and Timber Company of Coos Bay, Oregon.

The mining operations included extraction of mercury-bearing ore from underground tunnels and on-site milling and processing of ore in a rotary kiln to obtain elemental mercury. Tailings from the milling process were deposited on site, downhill from the former mill locations toward Dennis Creek. Dennis Creek flows within 30 feet of the mine tailings pile; an estimated 300,000 cubic yards of tailings are present at the site.

The SI involved the collection of samples from potential hazardous substance sources at the mine and from target areas potentially impacted through contaminant migration from on-site sources. A total of 52 samples (excluding QC samples) were collected for the SI. Sample locations included multiple locations at the on-site sources, Dennis Creek, Garoutte Creek downstream of its confluence with Dennis Creek, and nearby springs and domestic wells used for drinking water. Samples were analyzed for TAL inorganic elements at EPA's Manchester Laboratory.

8.1.1 Source Summary

Sources identified for the SI at Black Butte Mine include the Mine Tailings, the former mill/rotary kiln, and the Mine Adit. All of the sources sampled for the SI contained at least one hazardous substance at significant concentrations. Mercury, found in only one sample, and arsenic detected in seven samples, were the only contaminants detected at significant concentrations in the mine tailings. The former mill/rotary kiln soils contain 10 contaminants at significant concentrations, most notably mercury, which ranged in concentration from 91.9 mg/kg to 54,300 mg/kg, and arsenic which ranged in concentration from 114 mg/kg to 952 mg/kg. The Mine Adit water and sediments contain 9 contaminants at significant concentrations.

8.1.2 Migration Pathways and Targets Summary

Results of the SI indicate that migration of site-related contaminants has occurred. Groundwater samples collected from nearby springs and domestic wells contained elevated concentrations of inorganic elements that were also detected at significant concentrations in the on-site sources. Arsenic was detected above federal MCLs for drinking water in three of the domestic wells sampled for the SI. Mercury was not detected in any of the domestic well samples.

The red-colored mine tailings were observed in the stream channel of Dennis Creek during the SI field work. Although the surface water sample results from Dennis Creek and Garoutte Creek do not strongly indicate a release of contaminants to the water column, the migration of contaminants from tailings to the creek was confirmed by elevated concentrations of mercury in two sediment samples collected downstream of the "lower" tailings pile. However, no elevated contaminant concentrations in sediment were observed farther downstream in Garoutte Creek that can be attributed to releases from the mine sources. No sensitive environments or food chain targets exist in Dennis Creek; however, Garoutte Creek supports a small sport fishery (Cutthroat trout). Wetlands occur downstream of Garoutte Creek in the Coast Fork of the Willamette River, and the site area is known habitat for several endangered and threatened species.

8.2 CONCLUSIONS

CERCLA-regulated inorganic elements were detected in all of the on-site sources at Black Butte Mine. Releases of these contaminants may have occurred through groundwater migration and through runoff to a nearby creek. Water wells in the site vicinity contained seven inorganic elements at elevated concentrations, but mercury was not detected in any of the well samples. Arsenic concentrations in three well samples exceeded the MCL. The SI determined that elevated concentrations of mercury are present in creek sediments up to several hundred feet downstream of the mine tailings located at the site. No targets exist in the areas where elevated levels of contaminants were detected; however, a sport fishery and wetlands exist downstream of contaminated areas.

9. REFERENCES

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APPENDIX A
PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPH IDENTIFICATION SHEET

Camera Lens: Olympus 35 mm **TDD #:98-04-0004**

Site Name: Black Butte Mine Site Inspection

Photo No.	Dir.	Date	Time	By	Description
1.1	North	9/1/98	1330	WR	Collecting sample 98BBGC01SW
1.2	North	9/1/98	1330	WR	Sediment sample 98BBGC01SD
1.3	East	9/1/98	1345	WR	Location of sample 98BBDC01SW/SD
1.4	SE	9/1/98	1345	WR	Mouth of Dennis Creek at Garoutte Creek
1.5	SE	9/1/98	1345	WR	Samples 98BBDC01SW/SD
1.6	SE	9/1/98	1444	WR	Location of samples 98BBGC02SW/SD
1.7	SE	9/1/98	1444	WR	Samples 98BBGC02SW/SD
1.8	NW	9/2/98	1045	WR	Collecting sample 98BBDC02SW
1.9	NE	9/2/98	1045	WR	Location of sample 98BBDC02SD
1.10	NE	9/2/98	1045	WR	Samples 98BBDC02SW/SD
1.11	South	9/2/98	1242	WR	Location of 98BBDC03SW/SD
1.12	South	9/2/98	1242	WR	Slope of "lower" tailings pile from location of 98BBDC03SW/SD
1.13	South	9/2/98	1242	WR	Samples 98BBDC03SW/SD
1.14	South	9/2/98	1324	WR	Location of samples 98BBDC04SW/SD
1.15	West	9/2/98	1324	WR	Collecting sample 98BBDC04SD
1.16	West	9/2/98	1324	WR	Samples 98BBDC04SW/SD
1.17	West	9/2/98	1344	WR	Location of samples 98BBDC05SW/SD
1.18	West	9/2/98	1344	WR	Samples 98BBDC05SW/SD
1.19	North	9/2/98	1535	WR	Rotary kiln inside of mill building
1.20	South	9/2/98	1535	WR	Inside of mill building; rotary kiln and ore feeder tower
1.21	SE	9/2/98	1545	WR	Location of sample 98BBMK01SS
1.22	SW	9/2/98	1550	WR	Sample 98BBMK02SS
1.23	East	9/2/98	1600	WR	Sample 98BBMK03SS
1.24	South	9/2/98	1610	WR	Location of samples 98BBMK05SS and 98BBMK06SS
2.1	NE	9/3/98	1025	WR	Collecting sample 98BBMT01SB
2.2	NE	9/3/98	1045	WR	Samples 98BBMT01SS and 98BBMT01SB
2.3	SE	9/3/98	1056	WR	Collecting sample 98BBMT02SB
2.4	East	9/3/98	1115	WR	Samples 98BBMT02SS and 98BBMT02SB
2.5	NW	9/3/98	1145	WR	"Lower" tailings pile sloping toward Dennis Creek
2.6	East	9/3/98	1145	WR	East end of "lower" tailings pile sloping toward Dennis Creek
2.7	West	9/3/98	1145	WR	"Lower" tailings area
2.8	East	9/3/98	1214	WR	Collecting sample 98BBMT03SB at crest of "lower" tailings pile
2.9	North	9/3/98	1230	WR	Collecting sample 98BBMT04SB

PHOTOGRAPH IDENTIFICATION SHEET

Camera Lens: Olympus 35 mm

TDD #:98-04-0004
Site Name: Black Butte Mine Site Inspection

Photo No.	Dir.	Date	Time	By	Description
2.10	North	9/3/98	1230	WR	Samples 98BBMT04SS and 98BBMT04SB
2.11	NE	9/3/98	1338	WR	Samples 98BBMT05SS and 98BBMT05SB
2.12	North	9/3/98	1354	WR	Collecting sample 98BBMT06SB
2.13	North	9/3/98	1354	WR	Samples 98BBMT06SS and 98BBMT06SB
2.14	East	9/3/98	1430	WR	Mill structure ore tower
2.15	SE	9/3/98	1445	WR	Sample 98BBMK01SB
2.16	Down	9/3/98	1455	WR	Trap door in floor of mill: location of sample 98BBMK02SB
2.17	South	9/3/98	1455	WR	Sample 98BBMK02SB
2.18	South	9/3/98	1525	WR	Sample 98BBMK03SB
2.19	SW	9/3/98	1525	WR	Collecting sample 98BBMK04SB
2.20	SW	9/3/98	1536	WR	Sample 98BBMK04SB
3.1	West	9/1/98	1325	TM	Sample 98BBDW02GW
3.2	West	9/1/98	1325	TM	(b) residence well head
3.3	North	9/1/98	1400	TM	Sample 98BBDW03GW
3.4	North	9/1/98	1400	TM	(b) residence well location
3.5	South	9/1/98	1455	TM	Sample 98BBDW04GW
3.6	South	9/1/98	1455	TM	(b) residence well location
3.7	South	9/1/98	1525	TM	Sample 98BBDW05GW
3.8	South	9/1/98	1525	TM	(b) (6) residence well location
3.9	North	9/2/98	1030	TM	Sample 98BBDW06GW
3.10	North	9/2/98	1030	TM	(b) (6) residence well location
3.11	East	9/2/98	1315	SL	Collecting sample 98BBDW07GW
3.12	East	9/2/98	1315	SL	Spigot where sample 98BBDW07GW was collected
3.13	East	9/2/98	1400	TM	Sample 98BBDW08GW
3.14	East	9/2/98	1400	TM	(b) residence well location
3.15	NW	9/2/98	1430	TM	Sample 98BBDW09GW
3.16	East	9/2/98	1645	SL	Sample 98BBDW10GW
3.17	SW	9/3/98	1020	SL	Collecting sample 98BBMA01SW
3.18	SW	9/3/98	1020	SL	Collecting sample 98BBMA01SW
3.19	SW	9/3/98	1020	SL	Mine adit sign
3.20	SW	9/3/98	1020	SL	Location of sample 98BBMA01SW/SD
3.21	North	9/3/98	1020	SL	Drainage from adit
3.22	SW	9/3/98	1020	SL	Mine adit from road
3.23	NE	9/3/98	1020	SL	Culvert under road draining adit area

PHOTOGRAPH IDENTIFICATION SHEET

Camera Lens: Olympus 35 mm **TDD #:98-04-0004**

Site Name: Black Butte Mine Site Inspection

Photo No.	Dir.	Date	Time	By	Description
3.24	South	9/3/98	1330	SL	(b) spring location
3.25	South	9/3/98	1330	SL	Collecting sample 98BBSP01GW
4.1	East	9/3/98	1435	SL	Background sample 98BBBG01SS
4.2	East	9/3/98	1435	SL	Background sample 98BBBG01SB
4.3	West	9/3/98	1640	TM	Background sample 98BBBG02SS

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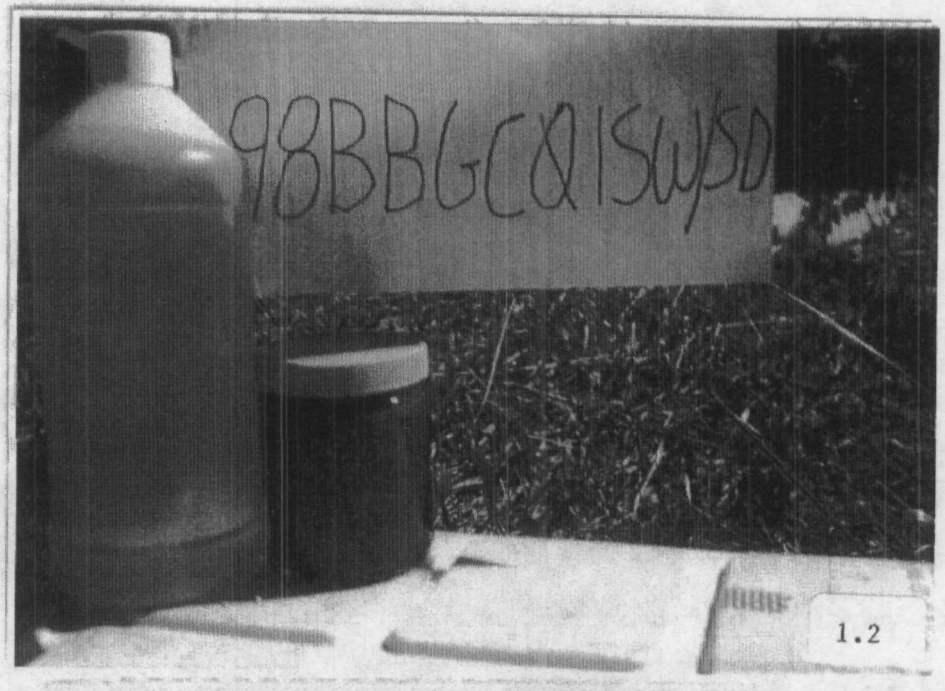

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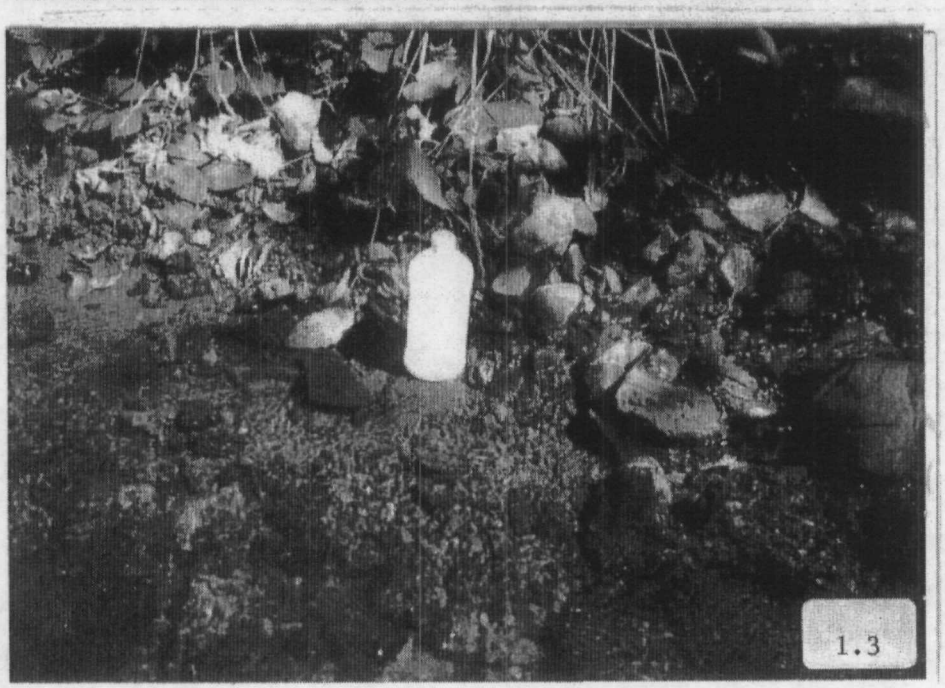

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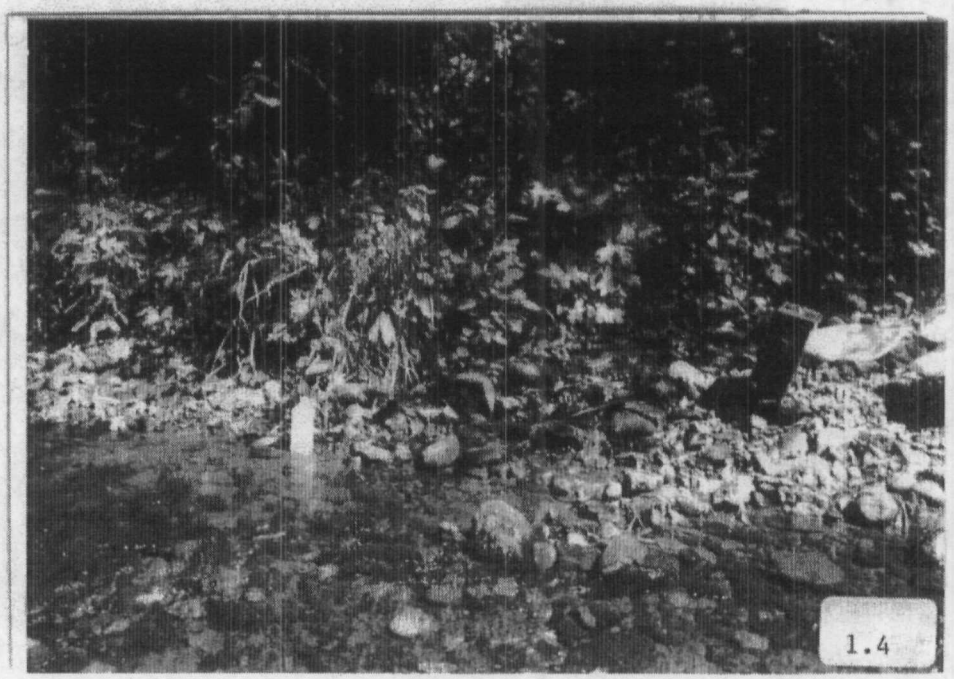

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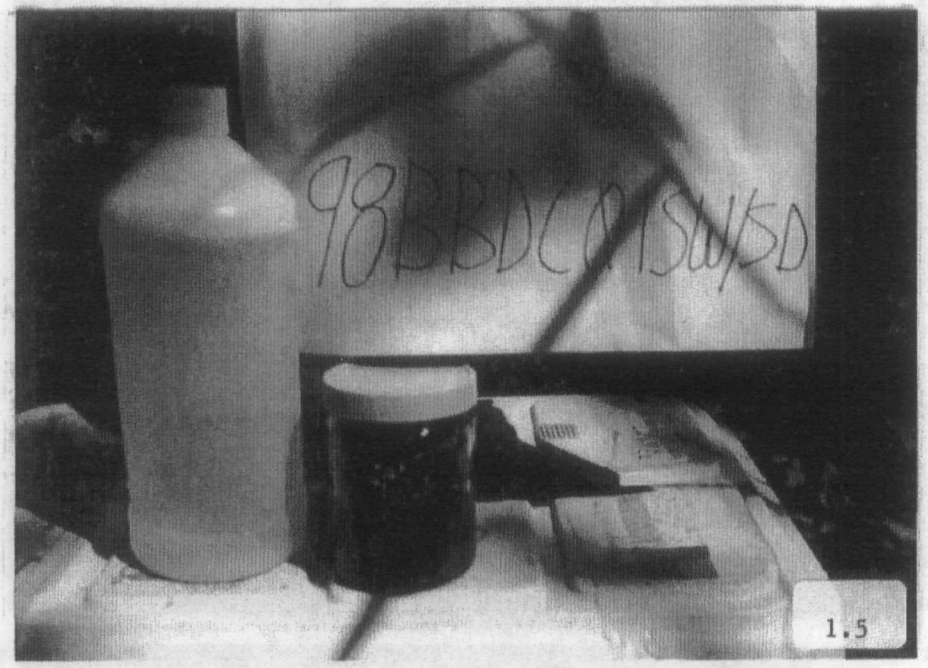

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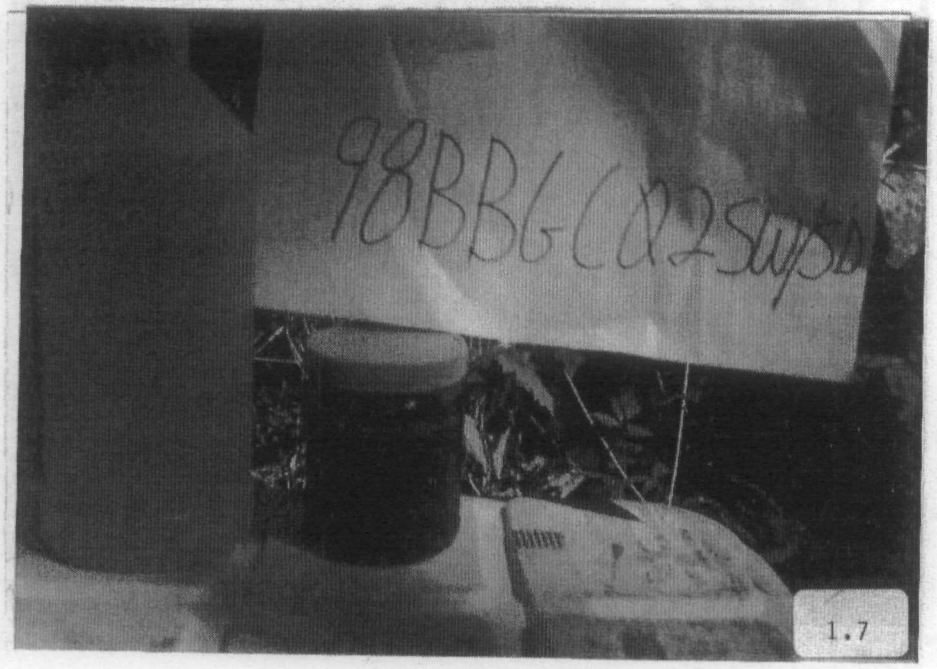

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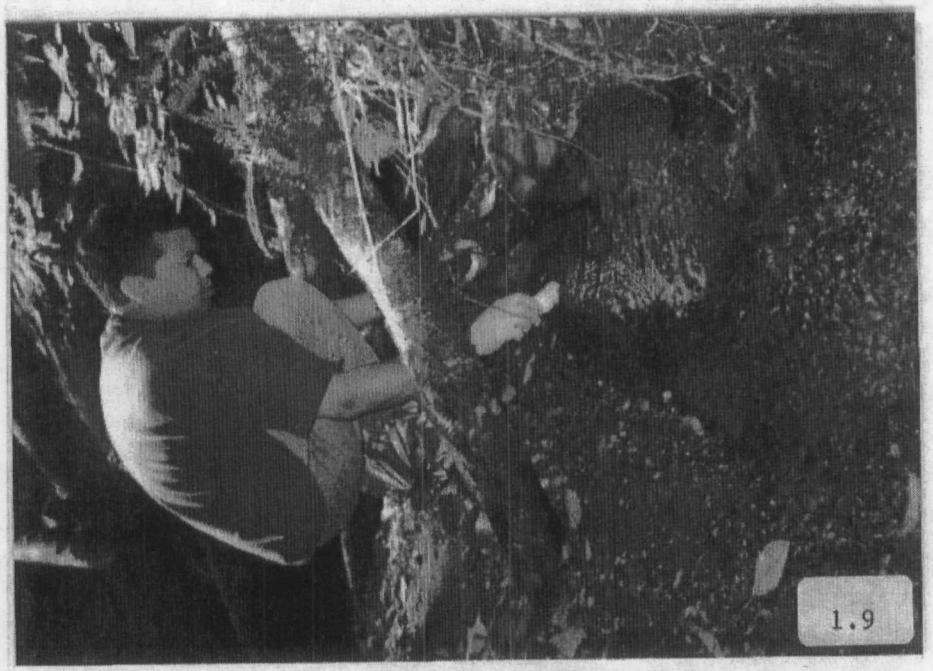

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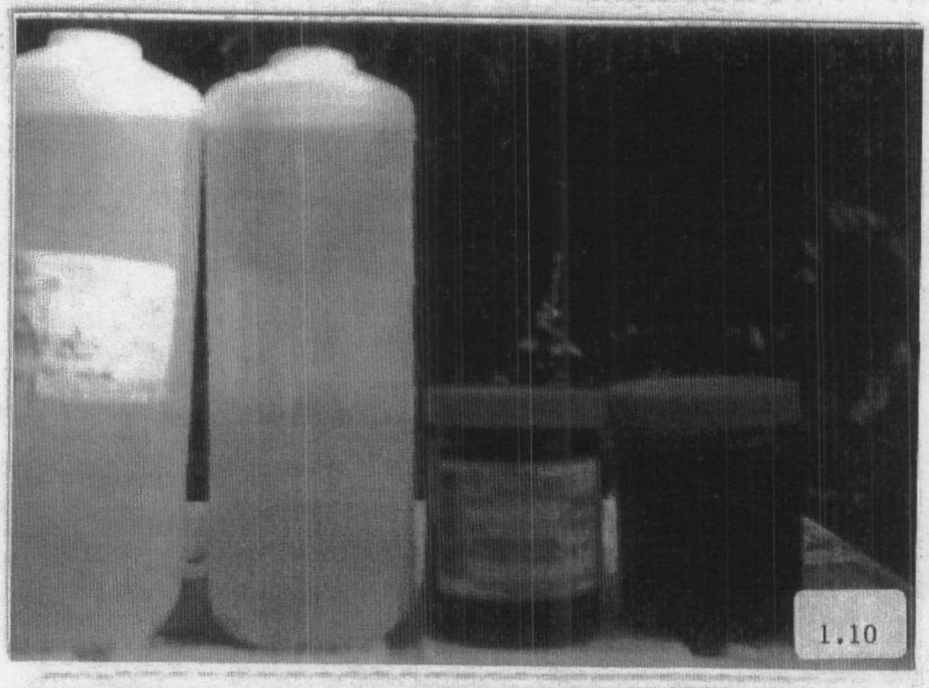

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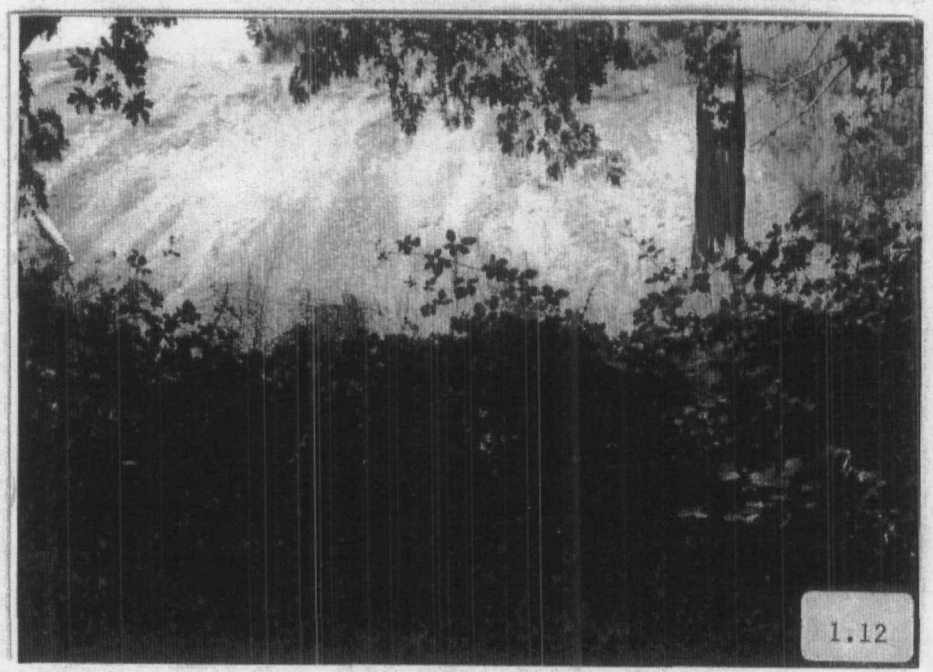

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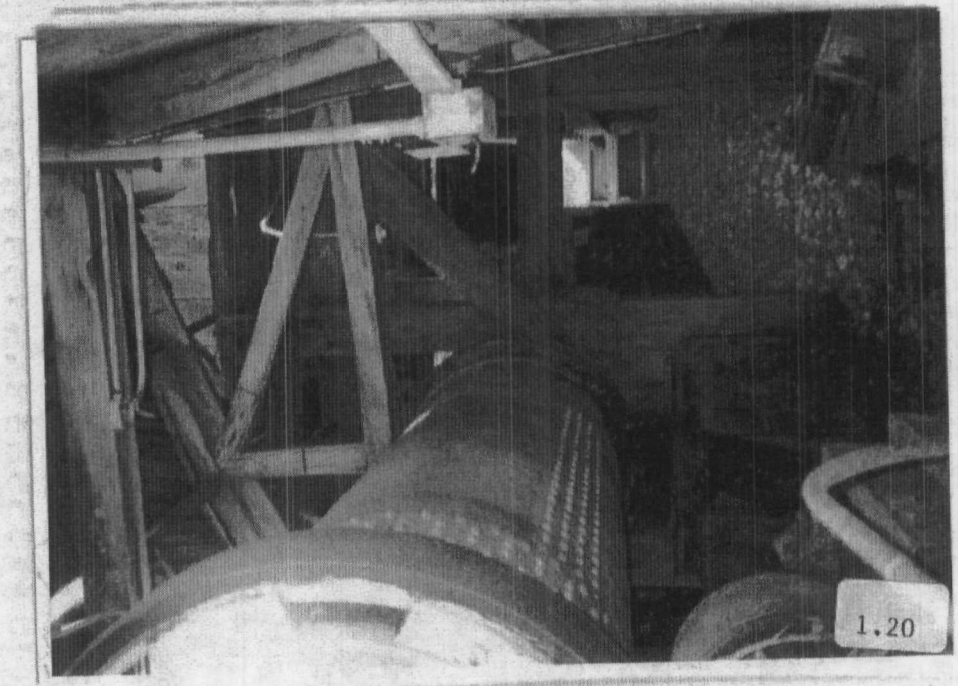

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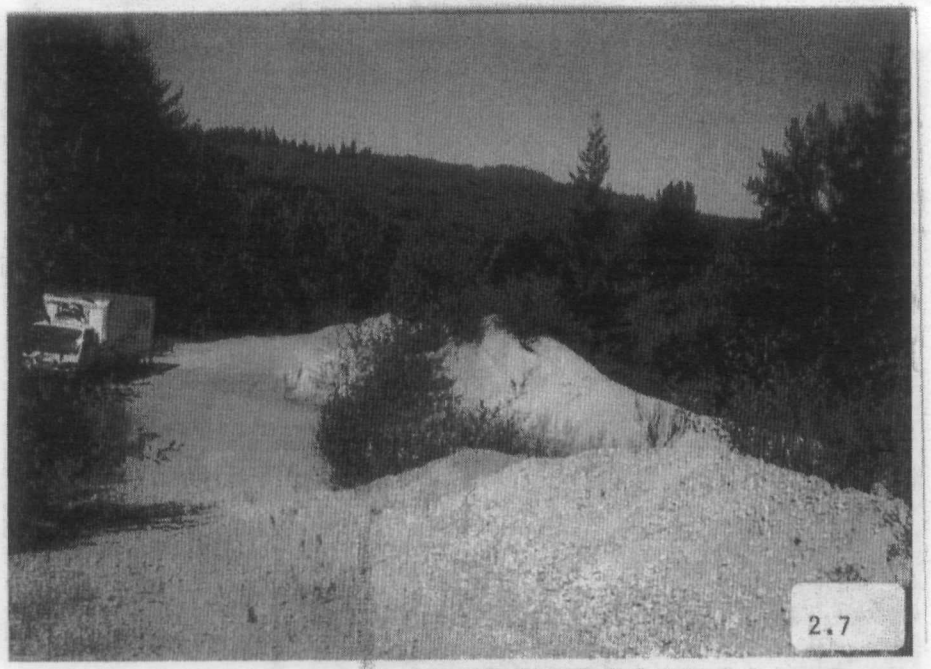

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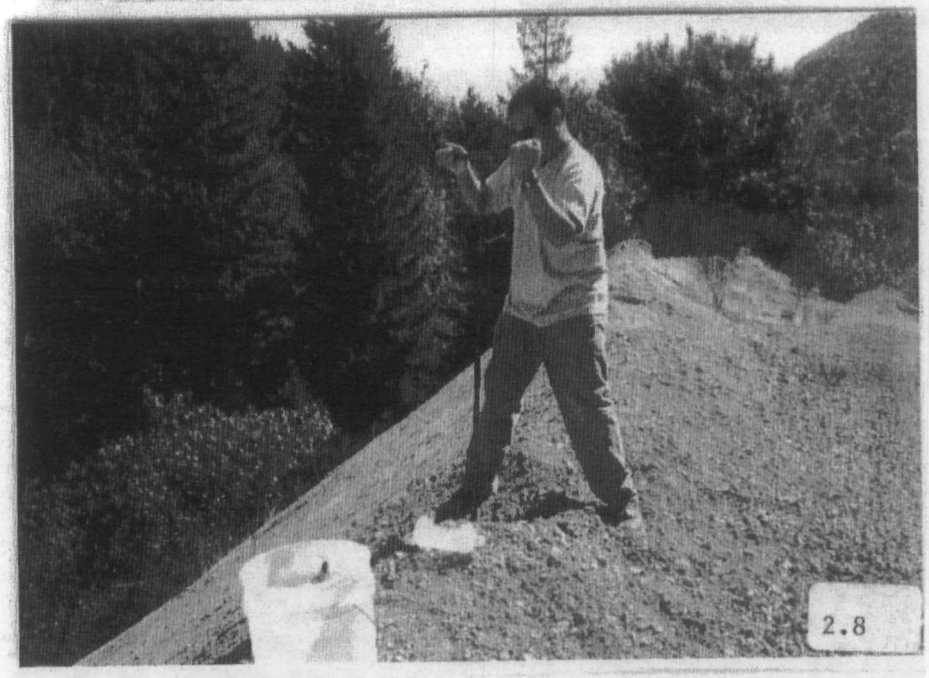

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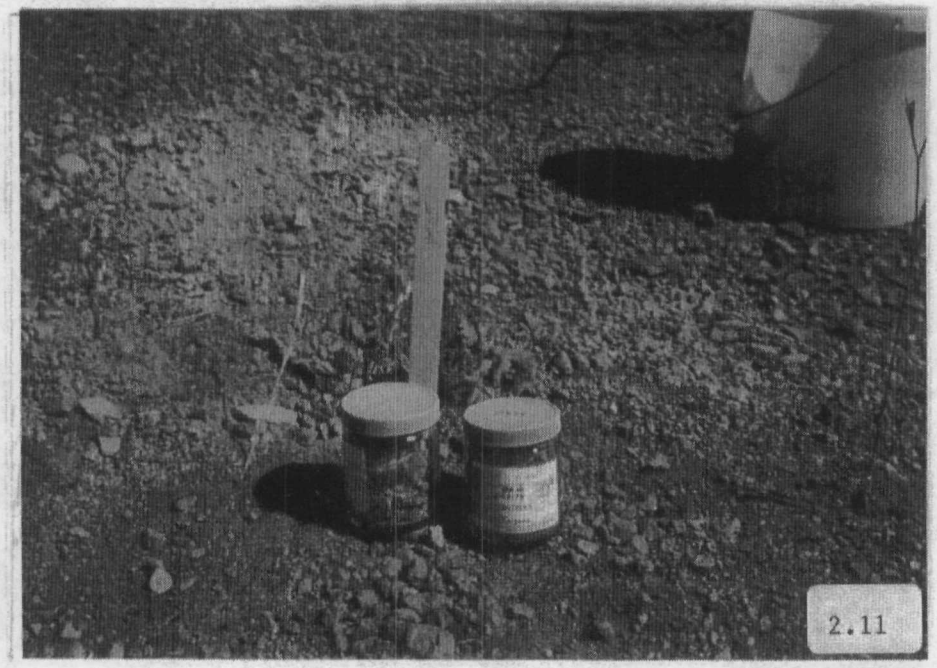

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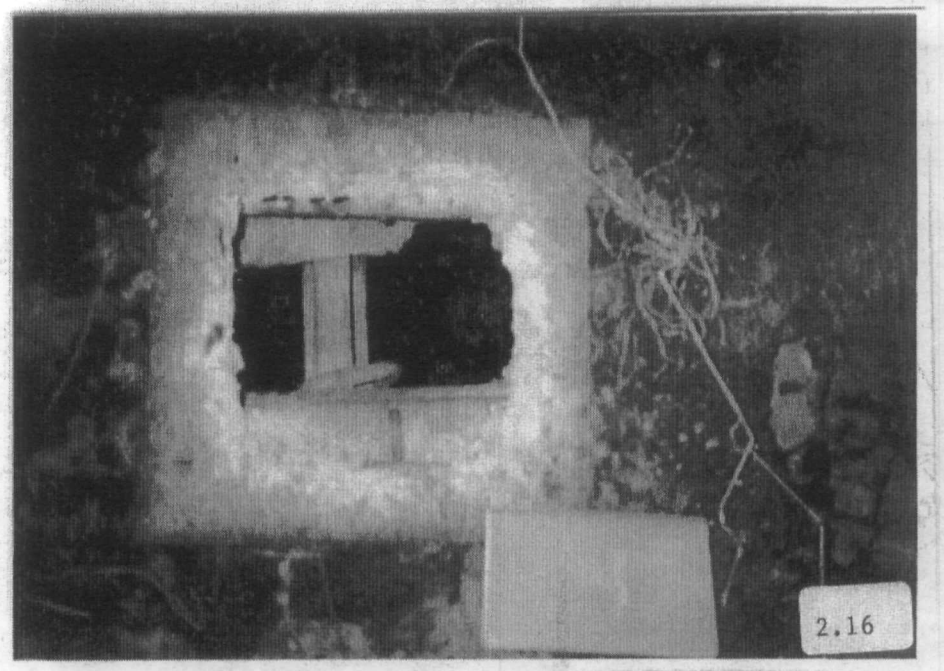

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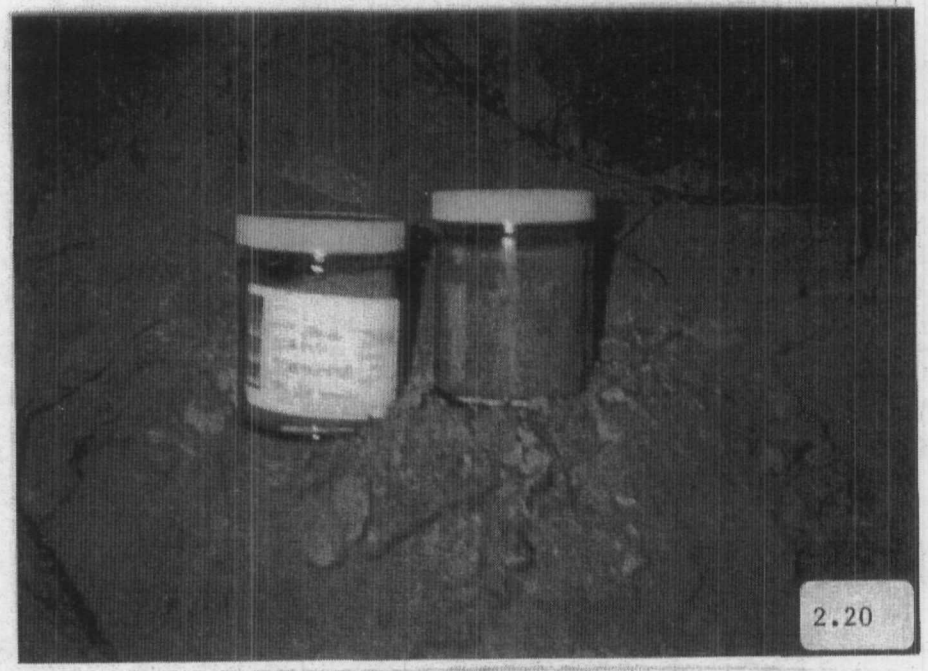

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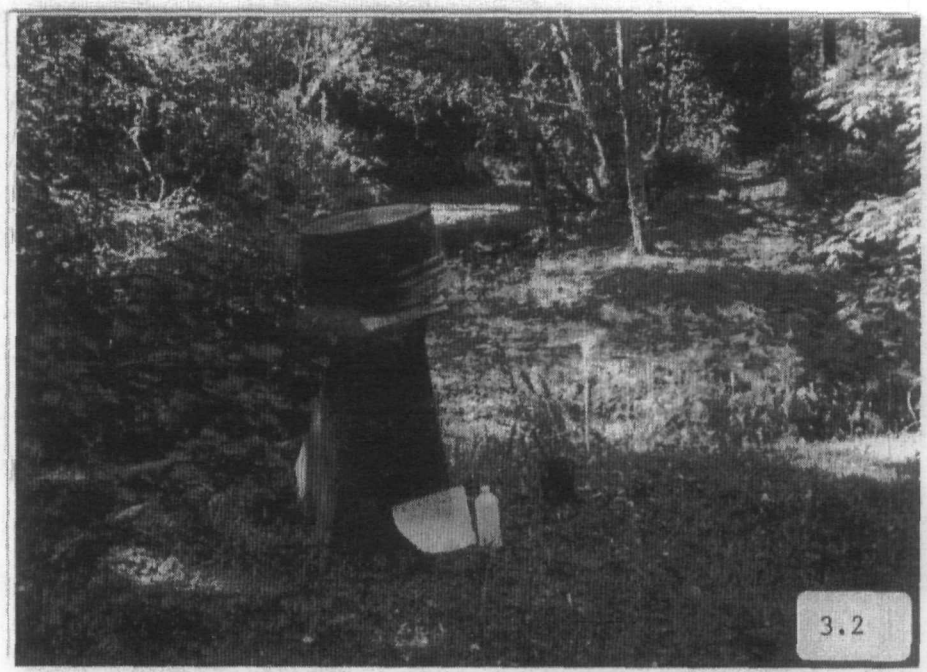

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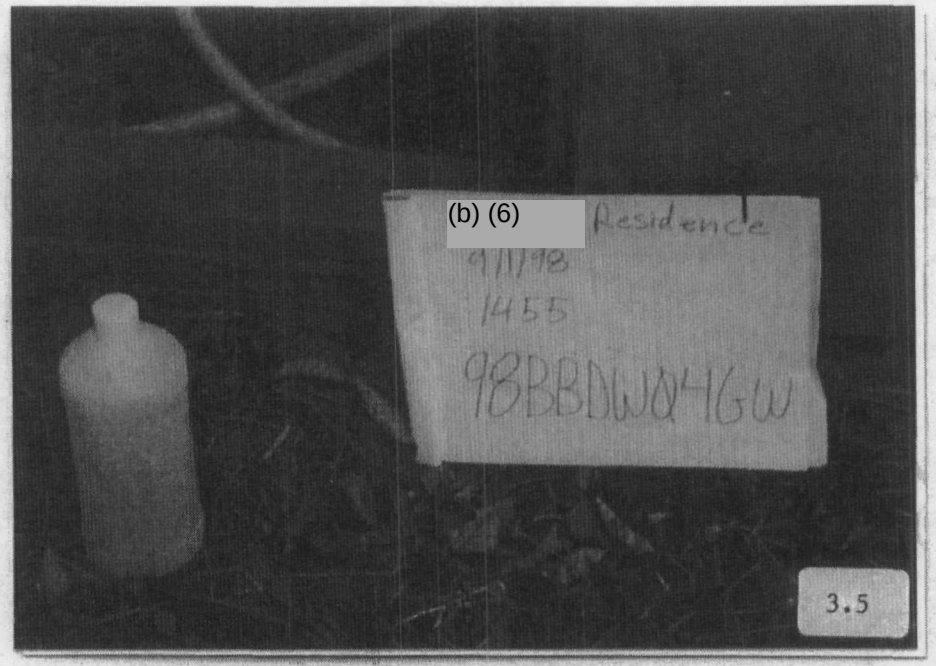

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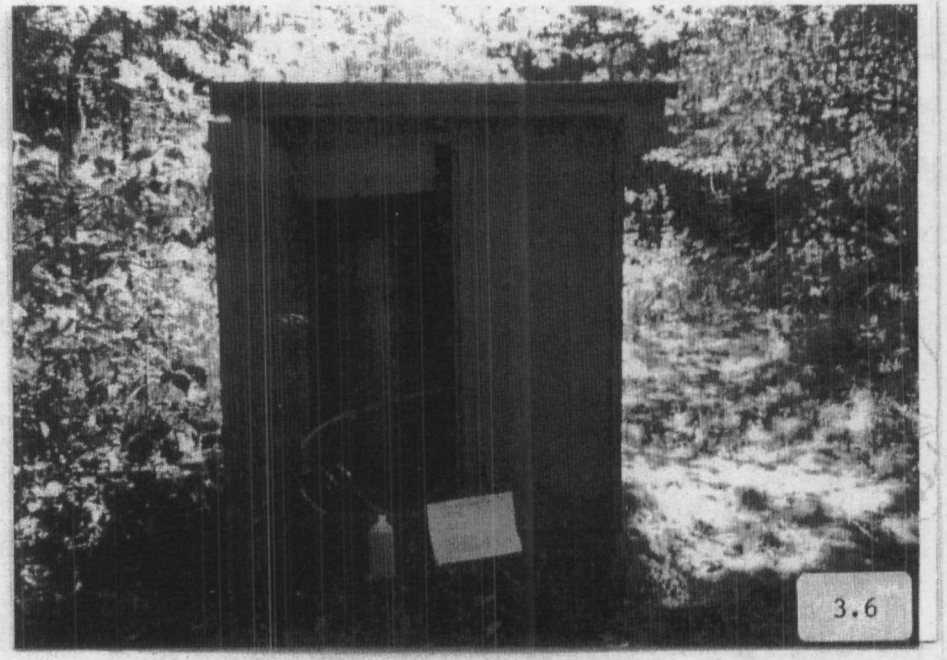

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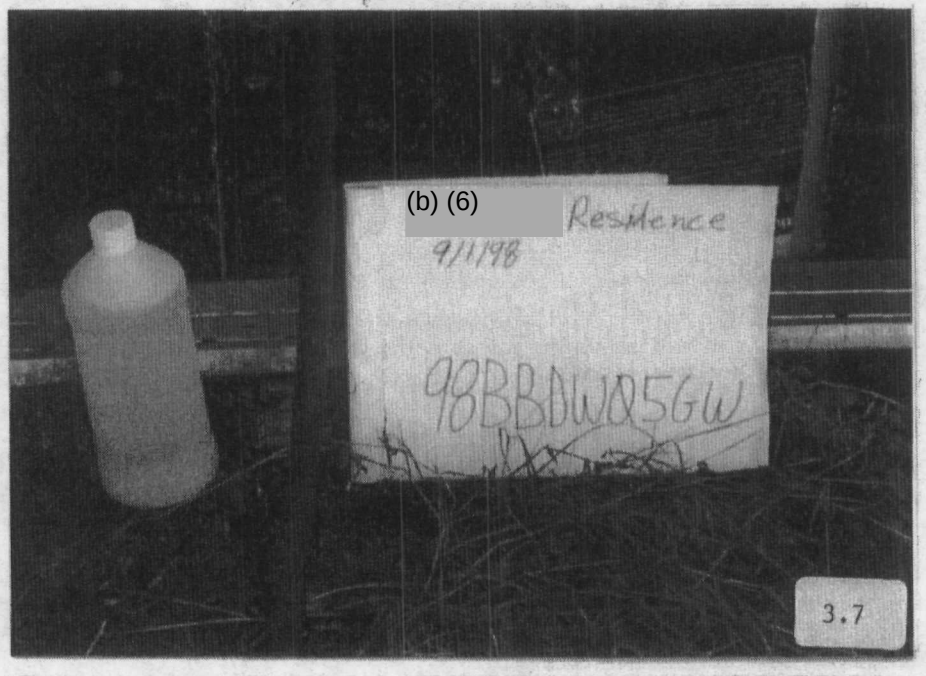

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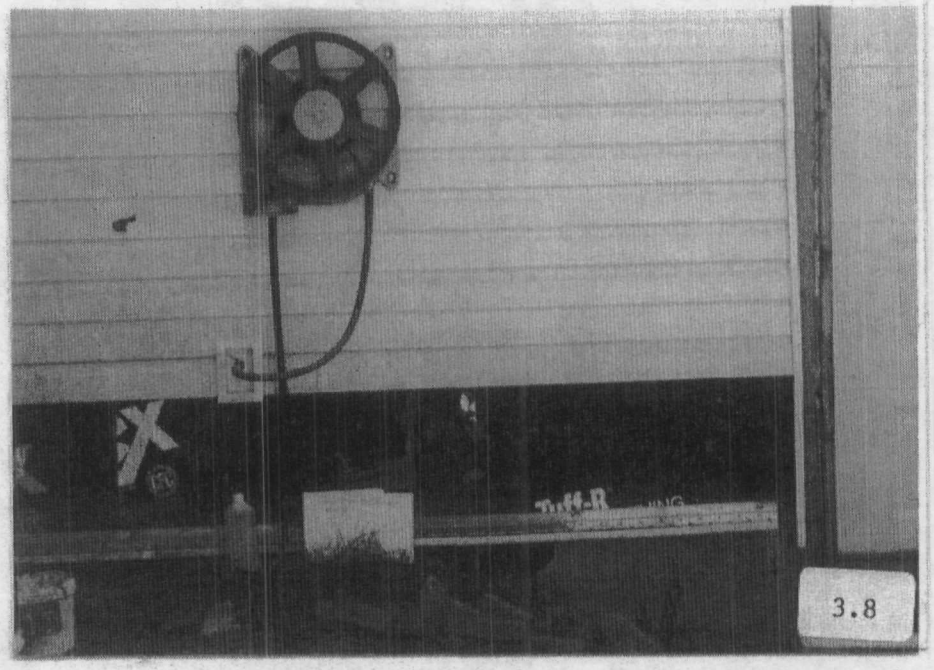

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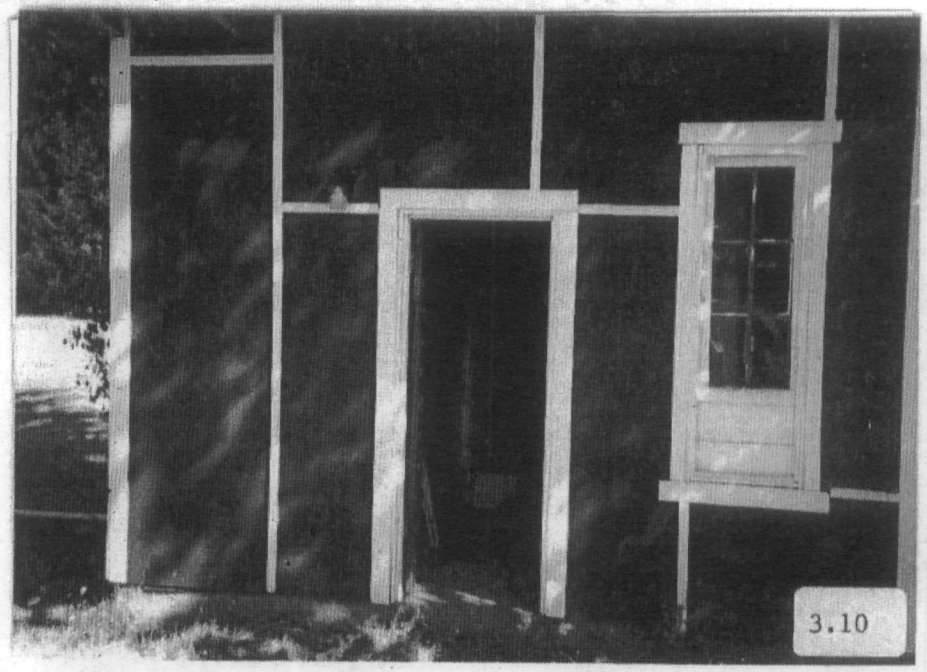

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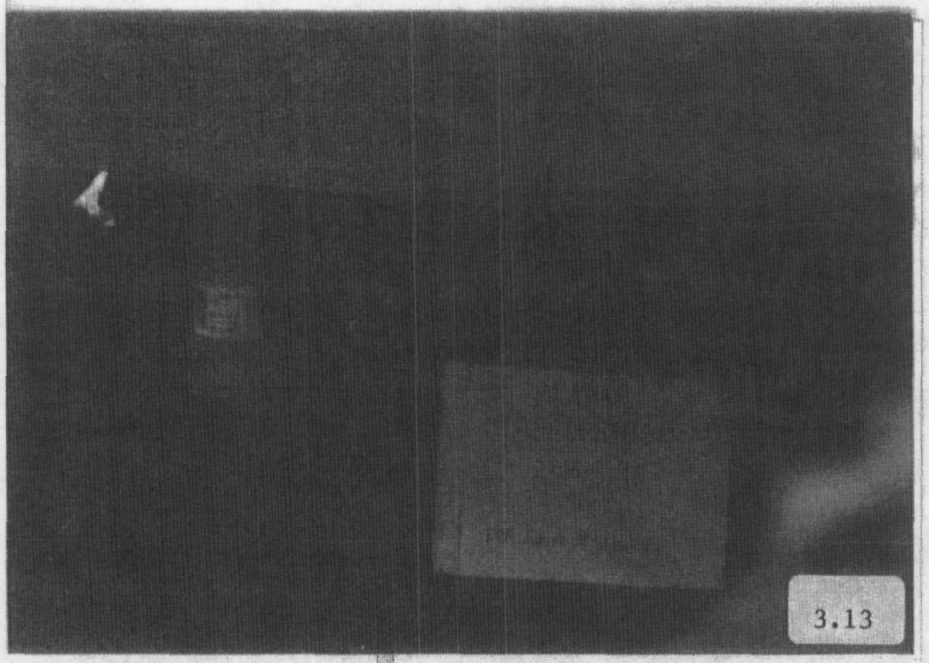

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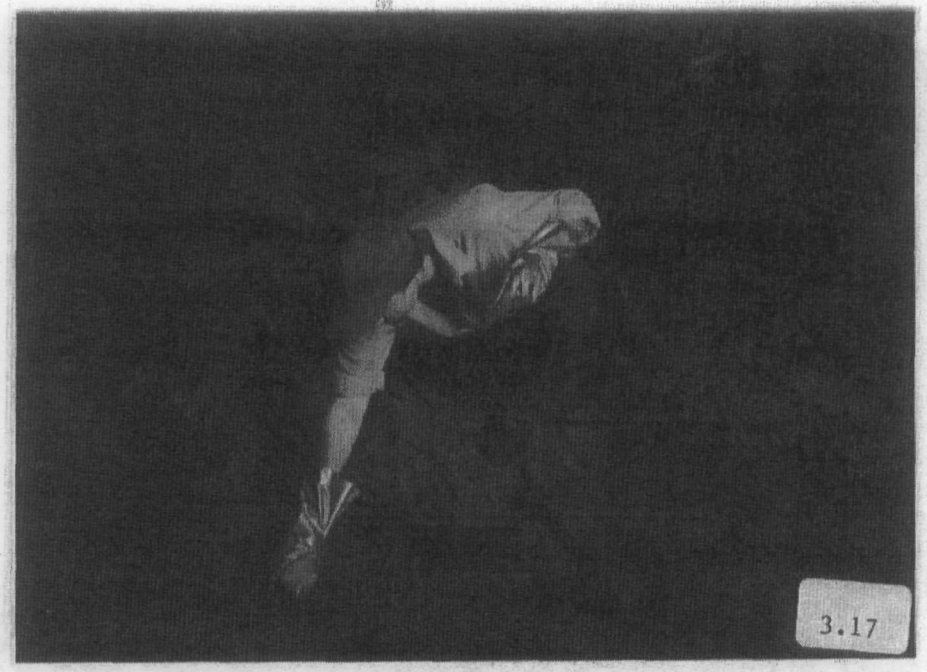

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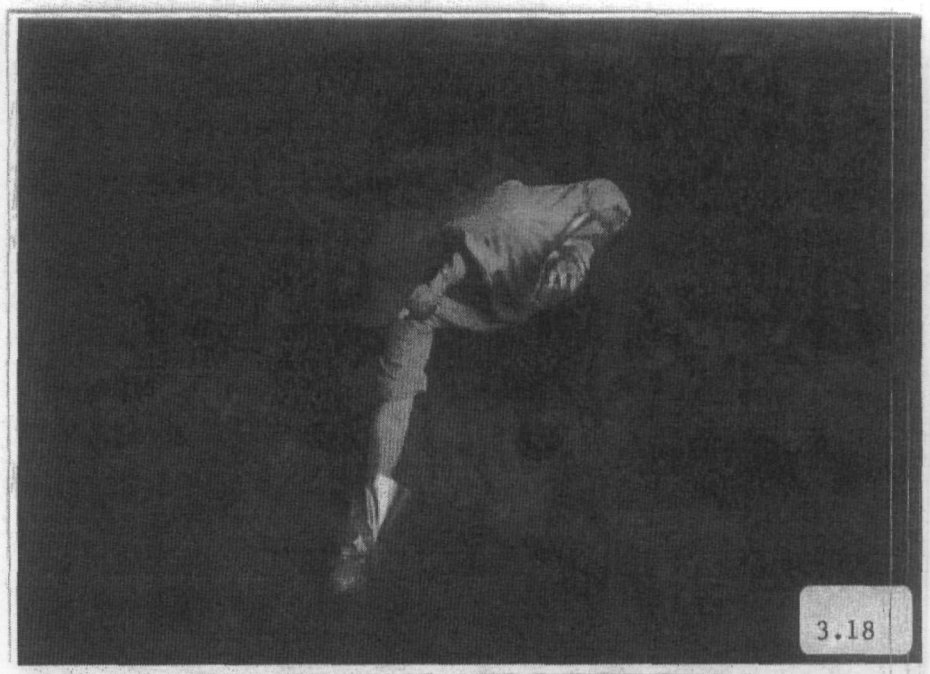

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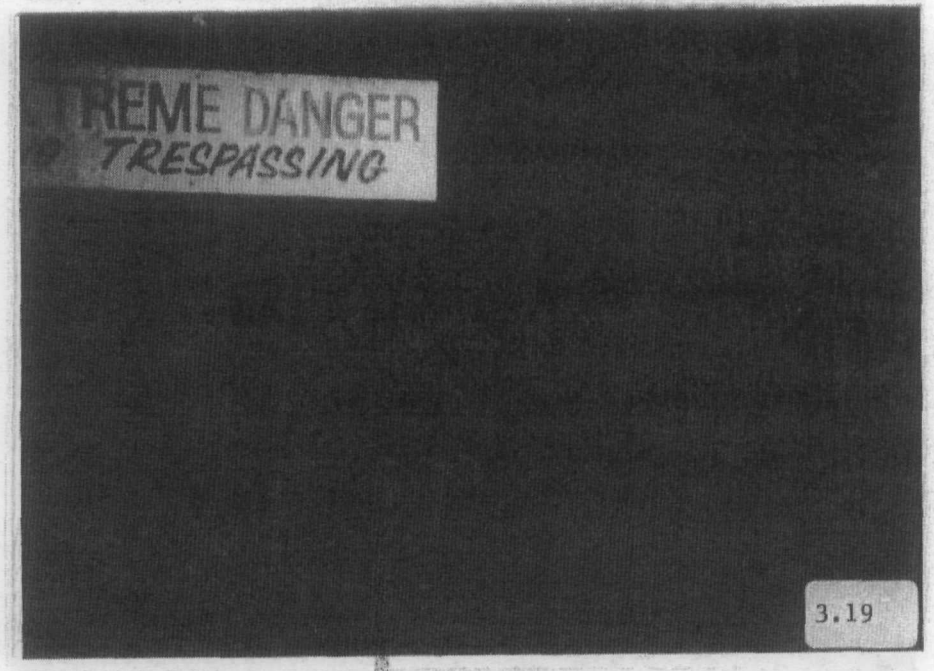

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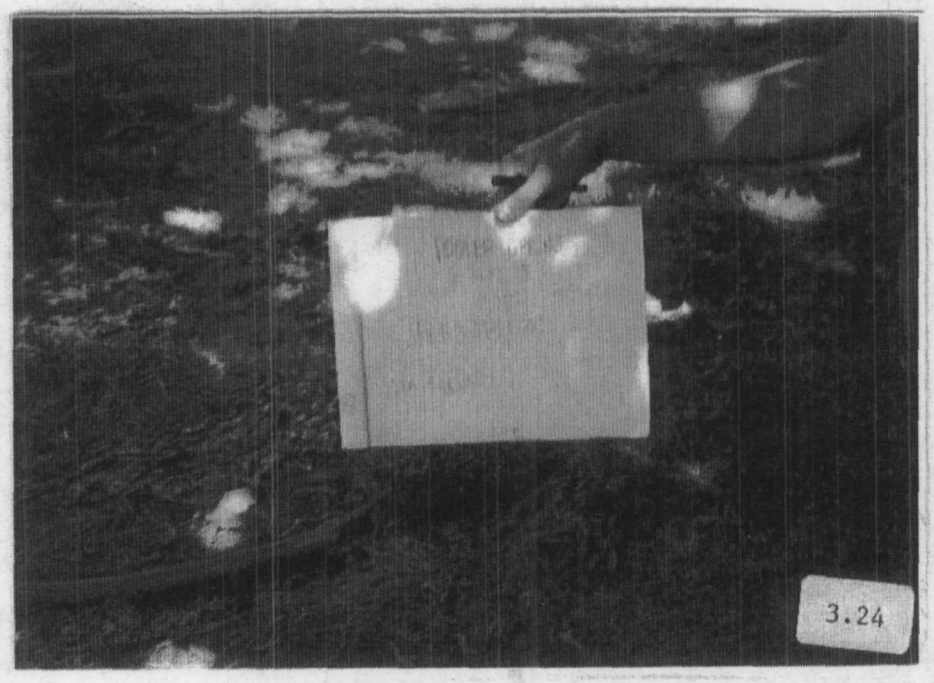

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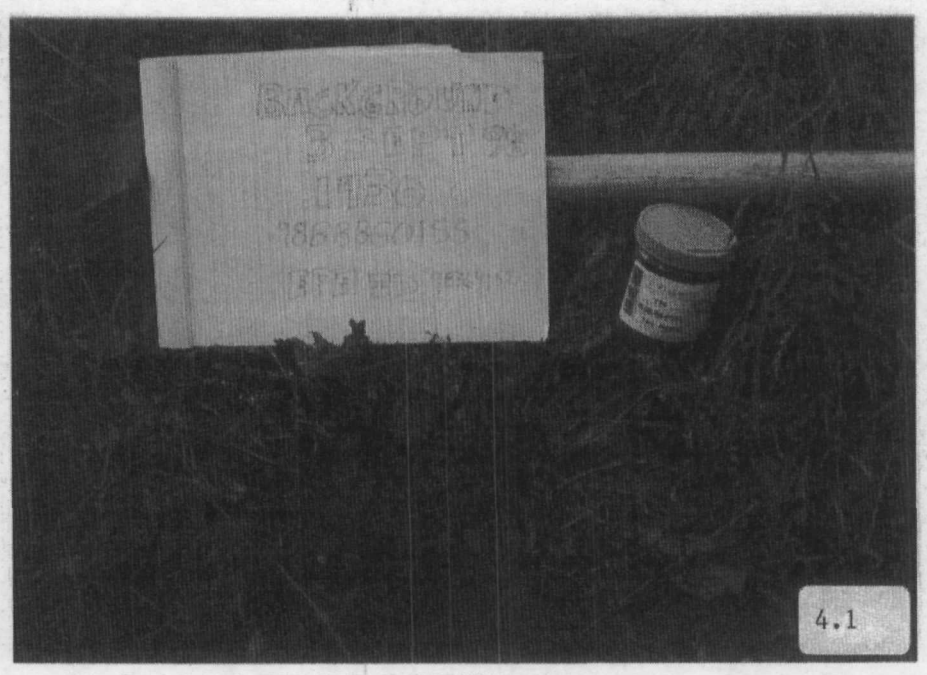

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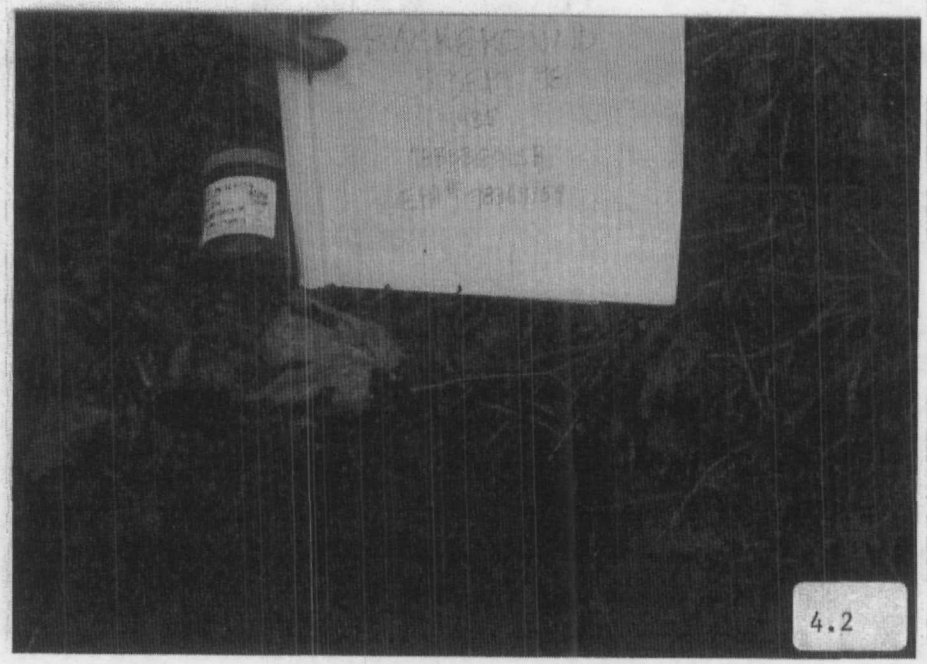

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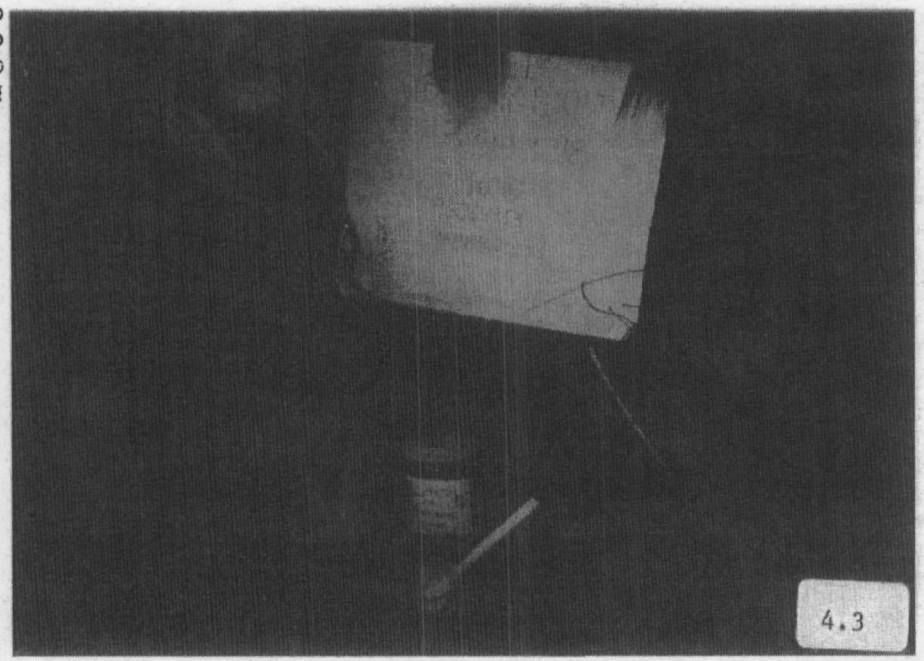

4.3

APPENDIX B
DATA VALIDATION MEMORANDA

ecology and environment, inc.
International Specialists in the Environment

1500 First Interstate Center, 999 Third Avenue
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: January 12, 1999

TO: Bill Richards, Project Manager, E & E, Seattle, WA

FROM: Mark Woodke, START-Chemist, E & E, Seattle, WA MW

SUBJ: ***Inorganic Data Quality Assurance Summary Check, Black Butte Mine Site, Cottage Grove, Oregon***

REF: TDD: 98-04-0004 PAN: CD0401SIDM

The data quality assurance summary check of 33 soil/sediment samples collected from the Black Butte Mine site located near Cottage Grove, Oregon, has been completed. Total Metals analyses (EPA CLP SOW Method ILMO4.0) was performed at the Manchester Environmental Laboratory, Port Orchard, Washington.

The following discrepancies were noted:

The review memorandum lists the analysis method as EPA CLP SOW ILMO4.0 while the data sheets list method ILM3.0. The original data reviewer stated that the correct method is ILMO4.0 and that the data sheets are incorrect due to software inconsistencies.

The review memorandum lists several mercury results to be qualified as estimated quantities (J) while the data sheets only list the laboratory qualifier (N). The original data reviewer stated that the qualifiers are equivalent. The secondary reviewer applied the (J) qualifiers as listed in the memorandum.

The review memorandum states that all selenium results should be qualified as estimated quantities (J); the selenium result in sample 98364149 was inadvertently unqualified. The secondary reviewer added the (J) qualifier to sample 98364149 as listed in the memorandum.

The following additional qualifiers were applied when necessary to indicate potential bias of estimated quantities :

L - Low Bias

H - High Bias

K - Unknown Bias

For ICP-AES and GFAAS analyses, the samples were grouped into two sets, set 1 included samples 98364122 through 98364141 while set 2 included samples 98364142 through 98364154.

Data Qualifications

The following comments refer to the ESAT performance in meeting quality control specifications outlined in the *CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILMO4.0,* the *Manchester Environmental Laboratory Quality Assurance Manual, rev. 5/88,* and the QA plan. The recommendations presented herein are based on the information provided for the review.

1.0 Timeliness -

The technical (40 CFR part 136) holding time from the date of collection for metals in water is 180 days (28 days for mercury). The samples were collected between 09/01/98 and 09/03/98. CVAAS (mercury) analyses were completed on 10/01/98. Samples 98364122, 98364123, and 98364124 were analyzed 2 days outside the mercury holding time. Samples 98364125, 98364126, 98364127, and 98364128 were analyzed 1 day outside the mercury holding time. Since these sample results were qualified based on matrix spike recovery and since the holding time was just exceeded, no further qualification was made based on holding time.

ICP-AES and GFAAS analyses were completed on 011/16/98. No qualification was made on this basis.

2.0 Sample Preparation - Acceptable

The samples were prepped for ICP-AES and GFAAS analyses on 09/25/98 (ICP/GFAAS set 1) and 09/29/98 (ICP/GFAAS set 2). All sample preparation was in accordance with Manchester Laboratory protocols.

The samples were prepped for CVAAS analyses using both 'wet' and 'dry' sample preparation procedures on 09/21/98, 09/28/98, and 09/30/98. All mercury sample preparation was in accordance with Manchester Laboratory protocols. No qualification was made based on sample preparation.

Note, the 'dry' sample preparations were done in attempt to reduce matrix homogeneity problems. For the 'dry' preparations, samples were grouped together based on percent solids and estimated sample concentrations. Sample 98364154 was relatively 'dry' to begin with (90% solids) but the difference between the 'wet' and 'dry' results was so great, mercury in this sample was qualified 'J', estimated.

3.0 Calibrations - Acceptable

The samples were analyzed by ICP-AES (Inductively Coupled Plasma - Atomic Emission Spec) on 10/16/98 (set 1), 10/20/98 (set 2), and

11/09/98 (dilution analyses for aluminum for set 1 samples 98364129 and 98364140). ICP-AES elements included Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb, Sb, V, and Zn. The instrument was standardized the day of analysis according to the analytical method using one blank and a single calibration standard for each element. All ICP calibrations were performed as required and met the acceptance criteria; therefore, no qualification was made on this basis.

Samples were analyzed by GFAAS (Graphite Furnace Atomic Absorption Spec) between 10/16/98 and 11/16/98 for arsenic, lead, selenium, and thallium. The instrument was standardized the day of analysis according to the analytical method using one blank and at least 3 standards. The calibration curves were linear and had correlation coefficients greater than 0.995. No qualification was made based on the GFAAS calibration.

The samples were analyzed by CVAAS (mercury) on 09/22/98, and 09/23/98 (using the initial 'wet' prep - only sample sets 1&2 were reported). Sample sets 3 & 4 were re-prepared and re-analyzed on 09/29/98 (only the first dry prep on sample set 3 was reported). Sample set 4 was analyzed on 10/01/98 (second dry prep analyzed and plus the first dry prep for sample 98364154 was analyzed and reported). The instrument was calibrated according to the analytical method with a matrix blank and five standards with the exception of the analysis on 10/01/98 which had a matrix blank and four standards. The calibration curves were linear and all had correlation coefficients greater than 0.995. No qualification was made based on the mercury calibrations.

4.0 Reference Control Samples/Calibration Verification -

Calibration verification samples are required before and after sample analysis and after every 10 samples during analysis. Metals recoveries must be within 90-110% (80-120% for mercury).

All ICP-AES, GFAAS, and CVAAS calibration verification samples met the frequency and recovery criteria; therefore no qualification was made based on ICP-AES, GFAAS, or CVAAS calibration verification.

Reference control samples were digested and analyzed along with the samples to verify the efficiency of laboratory procedures. Acceptance control limits of recovery for metals analyses are 80-120%. In addition, a <u>solid</u> reference control sample was digested and analyzed via ICP-AES and CVAAS. All recoveries met the acceptance criteria for reference control samples except for silver in the solid reference control sample for silver in <u>both</u> sets of ICP-AES samples (indicating low bias in the results). All silver results were qualified 'J', estimated due to solid reference control sample results.

5.0 Blanks -

A procedural blank was prepared with each set of samples to show

potential contamination from the analytical procedure. If an analyte was found in the associated blank, the sample results were qualified if the analyte concentration was less than five times the analytical value in the blank.

Calcium, iron, sodium, and antimony were detected in one or both of the ICP-AES preparation blanks. Arsenic and antimony with negative values greater than the IDL were detected in calibration blanks for ICP-AES. Based on blank contamination, associated sample results were qualified as follows: Sodium in samples 98364145 and 98364137 was qualified 'U', antimony in samples 98364132, 98364133, 98364137, and 98364141 was qualified 'J'.

Mercury was detected in the preparation blank however, all associated mercury results were greater than five times this blank level; therefore no mercury results were qualified on this basis.

6.0 ICP-AES Interference Check Sample -

The interference check sample (ICS) is analyzed by ICP-AES to verify interelement and background correction factors. Analysis is required at the beginning and end of each sample analysis run and recoveries must be between 80% and 120%. All ICS recoveries were within the recovery criterion. No qualification was made based on ICS analyses.

The samples' raw data was checked. Most of the samples had high concentrations of iron and some samples had high concentrations of aluminum. ICS-A results, sample results and theoretical analyte concentration equivalents arising from interferents (aluminum and iron in Table 2 of ILM04.0) were checked and evaluated. Since for these sample sets, ICS-A interferents were analyzed at a lower concentration than recommended by ILM04.0, insufficient information about interference due to aluminum and iron was obtained. Using professional judgement, the sample results were qualified as follows due to suspected aluminum and iron interference: any analyte less than 10 times the IDL that is interfered with by iron and/or aluminum was qualified 'UJ', estimated detection limit if iron was ≥100 mg/L and/or if aluminum was ≥250 mg/L in the sample.

All <u>detected</u> antimony results for sample set 2 and antimony in samples 98364132, 98364133, 98364137, and 98364141 was qualified 'UJ'.

Cadmium in samples 98364129 and 98364131 was qualified 'UJ'.

Other affected analytes were either 10 times above the detection limit or were reported via GFAAS and therefore were not qualified based on suspected interference.

7.0 Duplicate Analysis - Acceptable

Duplicate analysis was performed on samples 98364125 (sample set 1) and 98364151 (sample set 2) for ICP-AES and GFAAS analyses. All

results above the required detection limit were within the ±35% RPD soil criterion. No qualification was made based on duplicate analysis.

Duplicate analysis was performed on samples 98364135 (sample sets 1&2), 98364151 (sample set 3), and 98364125 (sample set 4) for CVAAS analyses. All reported results above the required detection limit were within the ±35% RPD soil criterion. No qualification was made based on duplicate analysis.

8.0 Field Duplicate Analysis - Not Applicable

Field duplicate analysis was not indicated in the field collection documentation.

9.0 Matrix Spike/Matrix Spike Duplicate Analysis -

Matrix spike sample analyses are done to provide information about the effect of the sample matrix on measurement methods. Matrix spike recovery must be within the limits of 75 - 125% for un-spiked sample results less than four times the spike amount.

Matrix Spike analysis was performed on samples 98364125 (sample set 1) and 98364151 (sample set 2) for ICP-AES and GFAAS analyses. All matrix spike analyses were within the acceptance criteria; with the exception of antimony (19.1% and 12.3% for set 1, 34.8% and 44.9% for set 2), copper (67.8% on one of the spikes for set 2), selenium (72% for both spikes for set 1, 49% and 54% for set 2), thallium (59% and 58% for set 1, 3% and 1% for set 2), and zinc (70.7% for one of the spikes for set 2). No copper or zinc results were qualified based on matrix spike recovery as the average spike recovery for each sample set was >75%.

Undetected antimony was qualified 'R', in sample set 1 due to the extremely low matrix spike recovery. All sample set 2 antimony results and any detected antimony results for sample set 1 were qualified 'J', estimated (low bias for samples 98364147 and 98364154, unknown bias for the other samples as they were also qualified based on suspected iron and/or aluminum interference and in some cases negative blank contamination).

All selenium results were qualified 'J', estimated (low bias suspected) due to matrix spike recovery.

Thallium was undetected in all sample set 2 samples and was qualified 'R', unuseable due to the extremely low matrix spike recovery. All sample set 1 thallium results were qualified 'J', estimated (low bias suspected) due to matrix spike recovery.

Matrix Spike and Matrix Spike Duplicate analyses were performed on samples 98364135 (mercury sample sets 1&2), 98364151 (mercury sample set 3), and 98364125 (mercury sample set 4) for CVAAS analyses. All

reported results with un-spiked sample results less than four times the spike amount were within the acceptance criteria with the exception of mercury for sample set 4 (177% & 156%). Mercury in sample set 4 samples was qualified 'J', estimated due to matrix spike recovery (high bias suspected).

10.0 Graphite Furnace Atomic Absorption Spec (GFAAS) QC -

GFAAS requires duplicate injections and an analytical post spike analysis for each sample. Duplicate injections must be within 20% RSD if the analyte concentration is greater than the practical quantitation limit. Post spike recovery must be within 85 - 115%.

All duplicate injections and post spike recoveries were within the specified criteria; with the exception of the post spike recovery for arsenic for sample 98364153 (82%), and for numerous selenium and thallium results (generally low post spike recoveries). Arsenic in sample 98364153 was qualified 'J', estimated due to the post spike recovery. Selenium and thallium results were already qualified due to matrix spike recovery and therefore required no further qualification.

11.0 ICP-AES Serial Dilution - Acceptable

Samples 98364129 (sample set 1) and 98364145 was analyzed by ICP-AES by serial dilution to check for potential interferences. All analytes which exceeded the minimum concentration criterion (50 times the IDL) agreed within 10% RPD. No qualification was made on this basis.

The un-diluted iron result for sample 98364145 and the un-diluted manganese result for sample 98364129 were above the linear range of the instrument. Since the serial dilution results were in agreement with the reported, un-diluted results, no action was taken.

12.0 Detection Limits - Acceptable

Sample results which fall below the instrument detection limit (IDL) are assigned the value of the instrument detection limit and the 'U' qualifier is attached.

Practical Quantitation Limit (PQL) samples are required to demonstrate a linear calibration curve near the PQL. PQL standards were run at the required frequency with the exception of the 11/13/98 thallium analysis - the initial PQL sample was not run before samples, however the final PQL sample was run. There is no current functional guidelines criteria for PQL recovery, therefore no data was qualified based on PQL recovery.

13.0 Overall Assessment of the Data

This validation of the data is based on the criteria outlined in the *National Functional Guidelines for Inorganic Data Review (02/94)*.

Approximately 19% of the data was qualified due to suspected sample non-homogeneity, reference control sample results, blank contamination, suspected interference, matrix spike recovery, or GFAAS post spike recovery. The data as qualified is acceptable for all purposes.

Below are the definitions for the National Functional Guidelines for Inorganic Data Review (02/94) qualifiers used when validating/ qualifying data from Inorganic analysis.

DATA QUALIFIERS

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

J - The associated value is an estimated quantity.

R - The data are unusable. (Note: Analyte may or may not be present.)

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364122
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98-BB-GC-01-SD		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**2.65**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**15500**	**mg/kg**	
	7440382	**Arsenic**	**26.8**	**mg/kg**	
	7440393	**Barium**	**80.9**	**mg/kg**	
	7440417	**Beryllium**	**0.811**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**5220**	**mg/kg**	
	7440473	**Chromium**	**42.9**	**mg/kg**	
	7440484	**Cobalt**	**17.4**	**mg/kg**	
	7440508	**Copper**	**62.9**	**mg/kg**	
	7439896	**Iron**	**46000**	**mg/kg**	
	7439954	**Magnesium**	**4820**	**mg/kg**	
	7439965	**Manganese**	**844**	**mg/kg**	
	7440020	**Nickel**	**21.1**	**mg/kg**	
	7440097	**Potassium**	**307**	**mg/kg**	
Sent to: Mark Ader	7440224	Silver	0.40	mg/kg	UJ L
Bill Richards	**7440235**	**Sodium**	**267**	**mg/kg**	
	7440622	**Vanadium**	**150**	**mg/kg**	
	7440666	**Zinc**	**95.6**	**mg/kg**	

98364122 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364123
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 01 SD		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	**3.58**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**19100**	**mg/kg**	
	7440382	**Arsenic**	**66.6**	**mg/kg**	
	7440393	**Barium**	**86.1**	**mg/kg**	
	7440417	**Beryllium**	**0.905**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3680**	**mg/kg**	
	7440473	**Chromium**	**45.4**	**mg/kg**	
	7440484	**Cobalt**	**24.2**	**mg/kg**	
	7440508	**Copper**	**68.9**	**mg/kg**	
	7439896	**Iron**	**55800**	**mg/kg**	
	7439954	**Magnesium**	**2980**	**mg/kg**	
	7439965	**Manganese**	**2260**	**mg/kg**	
	7440020	**Nickel**	**30.7**	**mg/kg**	
	7440097	**Potassium**	**401**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**262**	**mg/kg**	
	7440622	**Vanadium**	**111**	**mg/kg**	
	7440666	**Zinc**	**76.8**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364124
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB GC 02 SD		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	2.76	mg/kg	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	21500	mg/kg	
	7440382	**Arsenic**	33.9	mg/kg	
	7440393	**Barium**	94.8	mg/kg	
	7440417	**Beryllium**	0.882	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	5980	mg/kg	
	7440473	**Chromium**	38.1	mg/kg	
	7440484	**Cobalt**	17.6	mg/kg	
	7440508	**Copper**	73.8	mg/kg	
	7439896	**Iron**	51900	mg/kg	
	7439954	**Magnesium**	5700	mg/kg	
	7439965	**Manganese**	877	mg/kg	
	7440020	**Nickel**	19.4	mg/kg	
	7440097	**Potassium**	437	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	362	mg/kg	
	7440622	**Vanadium**	145	mg/kg	
	7440666	**Zinc**	88.0	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC02 SD - MS		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**4.57**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**16600**	**mg/kg**	
	7440382	**Arsenic**	**55.5**	**mg/kg**	
	7440393	**Barium**	**98.4**	**mg/kg**	
	7440417	**Beryllium**	**0.792**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3750**	**mg/kg**	
	7440473	**Chromium**	**35.6**	**mg/kg**	
	7440484	**Cobalt**	**27.8**	**mg/kg**	
	7440508	**Copper**	**64.9**	**mg/kg**	
	7439896	**Iron**	**43300**	**mg/kg**	
	7439954	**Magnesium**	**2830**	**mg/kg**	
	7439965	**Manganese**	**1230**	**mg/kg**	
	7440020	**Nickel**	**23.7**	**mg/kg**	
	7440097	**Potassium**	**322**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**143**	**mg/kg**	
	7440622	**Vanadium**	**97.5**	**mg/kg**	
	7440666	**Zinc**	**66.3**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	**4.24**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJL
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJL
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**16300**	**mg/kg**	
	7440382	**Arsenic**	**53.5**	**mg/kg**	
	7440393	**Barium**	**94.2**	**mg/kg**	
	7440417	**Beryllium**	**0.773**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3410**	**mg/kg**	
	7440473	**Chromium**	**32.7**	**mg/kg**	
	7440484	**Cobalt**	**27.5**	**mg/kg**	
	7440508	**Copper**	**66.7**	**mg/kg**	
	7439896	**Iron**	**42200**	**mg/kg**	
	7439954	**Magnesium**	**2490**	**mg/kg**	
	7439965	**Manganese**	**1220**	**mg/kg**	
	7440020	**Nickel**	**24.2**	**mg/kg**	
	7440097	**Potassium**	**259**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJL
	7440235	**Sodium**	**120**	**mg/kg**	
	7440622	**Vanadium**	**90.4**	**mg/kg**	
	7440666	**Zinc**	**66.4**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	77	%Rec	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	72	%Rec	
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	59	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum			NA
	7440702	Calcium			NA
	7439896	Iron			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7440360	Antimony	19	%Rec	
	7440382	Arsenic	98	%Rec	
	7440393	Barium	94	%Rec	
	7440417	Beryllium	102	%Rec	
	7440439	Cadmium	95	%Rec	
	7440473	Chromium	103	%Rec	
	7440484	Cobalt	96	%Rec	
	7440508	Copper	103	%Rec	
	7439921	Lead	96	%Rec	
	7439965	Manganese	117	%Rec	
	7440020	Nickel	98	%Rec	
	7440224	Silver	92	%Rec	
	7440622	Vanadium	105	%Rec	
	7440666	Zinc	99	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7439921	Lead	81	%Rec	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	72	%Rec	
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	58	%Rec	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7429905	Aluminum			NA
	7440702	Calcium			NA
	7439896	Iron			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7440360	Antimony	12	%Rec	
	7440382	Arsenic	95	%Rec	
	7440393	Barium	95	%Rec	
	7440417	Beryllium	103	%Rec	
	7440439	Cadmium	96	%Rec	
	7440473	Chromium	104	%Rec	
	7440484	Cobalt	95	%Rec	
	7440508	Copper	100	%Rec	
	7439921	Lead	97	%Rec	
	7439965	Manganese	88	%Rec	
	7440020	Nickel	99	%Rec	
	7440224	Silver	91	%Rec	
	7440622	Vanadium	108	%Rec	
	7440666	Zinc	103	%Rec	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364126
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 03 SD		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	**3.14**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**15100**	**mg/kg**	
	7440382	**Arsenic**	**63.9**	**mg/kg**	
	7440393	**Barium**	**104**	**mg/kg**	
	7440417	**Beryllium**	**0.948**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3990**	**mg/kg**	
	7440473	**Chromium**	**47.2**	**mg/kg**	
	7440484	**Cobalt**	**25.0**	**mg/kg**	
	7440508	**Copper**	**65.1**	**mg/kg**	
	7439896	**Iron**	**61100**	**mg/kg**	
	7439954	**Magnesium**	**2620**	**mg/kg**	
	7439965	**Manganese**	**1260**	**mg/kg**	
	7440020	**Nickel**	**27.1**	**mg/kg**	
	7440097	**Potassium**	**339**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**188**	**mg/kg**	
	7440622	**Vanadium**	**135**	**mg/kg**	
	7440666	**Zinc**	**83.6**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364127
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 04 SD		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	3.17	mg/kg	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	17300	mg/kg	
	7440382	**Arsenic**	66.7	mg/kg	
	7440393	**Barium**	115	mg/kg	
	7440417	**Beryllium**	0.802	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	4630	mg/kg	
	7440473	**Chromium**	38.7	mg/kg	
	7440484	**Cobalt**	21.5	mg/kg	
	7440508	**Copper**	66.2	mg/kg	
	7439896	**Iron**	42900	mg/kg	
	7439954	**Magnesium**	3700	mg/kg	
	7439965	**Manganese**	1190	mg/kg	
	7440020	**Nickel**	21.2	mg/kg	
	7440097	**Potassium**	313	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	180	mg/kg	
	7440622	**Vanadium**	98.9	mg/kg	
	7440666	**Zinc**	69.6	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364128
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 05 SD		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7439921	Lead	3.27	mg/kg	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ L
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ L
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	Aluminum	20200	mg/kg	
	7440382	Arsenic	79.5	mg/kg	
	7440393	Barium	113	mg/kg	
	7440417	Beryllium	0.850	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	Calcium	4600	mg/kg	
	7440473	Chromium	45.4	mg/kg	
	7440484	Cobalt	20.6	mg/kg	
	7440508	Copper	71.7	mg/kg	
	7439896	Iron	47900	mg/kg	
	7439954	Magnesium	3820	mg/kg	
	7439965	Manganese	1160	mg/kg	
	7440020	Nickel	23.5	mg/kg	
	7440097	Potassium	410	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	Sodium	211	mg/kg	
	7440622	Vanadium	114	mg/kg	
	7440666	Zinc	72.6	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364129
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MA01SD		

			Result	Units	Qlfr
MET					
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**84000**	**mg/kg**	
	7440382	**Arsenic**	**50.8**	**mg/kg**	
	7440393	**Barium**	**114**	**mg/kg**	
	7440417	**Beryllium**	**10.8**	**mg/kg**	
	7440439	Cadmium	0.86	mg/kg	UJ K
	7440702	**Calcium**	**2210**	**mg/kg**	
	7440473	**Chromium**	**88.8**	**mg/kg**	
	7440484	**Cobalt**	**325**	**mg/kg**	
	7440508	**Copper**	**967**	**mg/kg**	
	7439896	**Iron**	**41900**	**mg/kg**	
	7439921	**Lead**	**25.9**	**mg/kg**	
	7439965	**Manganese**	**8320**	**mg/kg**	
	7440020	**Nickel**	**168**	**mg/kg**	
	7440097	**Potassium**	**380**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**39.6**	**mg/kg**	
	7440622	**Vanadium**	**119**	**mg/kg**	
	7440666	**Zinc**	**297**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364130
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT01SS		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	4.98	mg/kg	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	Aluminum	8000	mg/kg	
	7440382	Arsenic	52.0	mg/kg	
	7440393	Barium	39.7	mg/kg	
	7440417	Beryllium	1.14	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	Calcium	668	mg/kg	
	7440473	Chromium	22.4	mg/kg	
	7440484	Cobalt	20.6	mg/kg	
	7440508	Copper	48.3	mg/kg	
	7439896	Iron	76100	mg/kg	
	7439954	Magnesium	198	mg/kg	
	7439965	Manganese	329	mg/kg	
	7440020	Nickel	11.8	mg/kg	
	7440097	Potassium	130	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	Sodium	20.2	mg/kg	
	7440622	Vanadium	219	mg/kg	
	7440666	Zinc	112	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364131
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98-BB-MT02SS		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**9.47**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**17000**	**mg/kg**	
	7440382	**Arsenic**	**52.9**	**mg/kg**	
	7440393	**Barium**	**43.4**	**mg/kg**	
	7440417	**Beryllium**	**0.896**	**mg/kg**	
	7440439	Cadmium	0.28	mg/kg	UJ K
	7440702	**Calcium**	**1650**	**mg/kg**	
	7440473	**Chromium**	**28.5**	**mg/kg**	
	7440484	**Cobalt**	**17.2**	**mg/kg**	
	7440508	**Copper**	**47.9**	**mg/kg**	
	7439896	**Iron**	**41400**	**mg/kg**	
	7439954	**Magnesium**	**429**	**mg/kg**	
	7439965	**Manganese**	**446**	**mg/kg**	
	7440020	**Nickel**	**13.2**	**mg/kg**	
	7440097	**Potassium**	**205**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**52.9**	**mg/kg**	
	7440622	**Vanadium**	**115**	**mg/kg**	
	7440666	**Zinc**	**95.2**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364132
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT03SS		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	7.24	mg/kg	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	**Aluminum**	70000	mg/kg	
	7440360	Antimony	6.5	mg/kg	UJ K
	7440382	**Arsenic**	269	mg/kg	
	7440393	**Barium**	10.2	mg/kg	
	7440417	**Beryllium**	1.13	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	427	mg/kg	
	7440473	**Chromium**	95.6	mg/kg	
	7440484	**Cobalt**	16.3	mg/kg	
	7440508	**Copper**	97.9	mg/kg	
	7439896	**Iron**	57600	mg/kg	
	7439954	**Magnesium**	415	mg/kg	
	7439965	**Manganese**	630	mg/kg	
	7440020	**Nickel**	35.3	mg/kg	
	7440097	**Potassium**	75	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	143	mg/kg	
	7440622	**Vanadium**	115	mg/kg	
	7440666	**Zinc**	53.9	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364133
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT04SS		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**7.96**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**61700**	**mg/kg**	
	7440360	Antimony	13	mg/kg	~~UJ~~ UJK
	7440382	**Arsenic**	**348**	**mg/kg**	
	7440393	**Barium**	**14.6**	**mg/kg**	
	7440417	**Beryllium**	**1.08**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**278**	**mg/kg**	
	7440473	**Chromium**	**79.2**	**mg/kg**	
	7440484	**Cobalt**	**12.4**	**mg/kg**	
	7440508	**Copper**	**96.4**	**mg/kg**	
	7439896	**Iron**	**59700**	**mg/kg**	
	7439954	**Magnesium**	**214**	**mg/kg**	
	7439965	**Manganese**	**265**	**mg/kg**	
	7440020	**Nickel**	**35.4**	**mg/kg**	
	7440097	**Potassium**	**81**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**119**	**mg/kg**	
	7440622	**Vanadium**	**117**	**mg/kg**	
	7440666	**Zinc**	**35.5**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364134
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT05SS		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	5.13	mg/kg	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	28700	mg/kg	
	7440382	**Arsenic**	109	mg/kg	
	7440393	**Barium**	21.7	mg/kg	
	7440417	**Beryllium**	0.744	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	2060	mg/kg	
	7440473	**Chromium**	49.1	mg/kg	
	7440484	**Cobalt**	24.0	mg/kg	
	7440508	**Copper**	69.9	mg/kg	
	7439896	**Iron**	41100	mg/kg	
	7439954	**Magnesium**	914	mg/kg	
	7439965	**Manganese**	800	mg/kg	
	7440020	**Nickel**	20.1	mg/kg	
	7440097	**Potassium**	205	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	92.9	mg/kg	
	7440622	**Vanadium**	93.3	mg/kg	
	7440666	**Zinc**	52.2	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364135
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT06SS		

MET

Parameter : Lead by AA, RAS
Method : 200.9 Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN
Prep Method: ILM04.0

Analytes	Result	Units	Qlfr
7439921 Lead	9.59	mg/kg	

Parameter : Selenium by AA, RAS
Method : 200.9 Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN
Prep Method: ILM04.0

Analytes	Result	Units	Qlfr
7782492 Selenium	0.40	mg/kg	UJ

Parameter : Thallium by AA, RAS
Method : 200.9 Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN
Prep Method: ILM04.0

Analytes	Result	Units	Qlfr
7440280 Thallium	0.40	mg/kg	UJ

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: ILM04.0

Analytes	Result	Units	Qlfr
7440360 Antimony			R
7429905 Aluminum	70700	mg/kg	
7440382 Arsenic	382	mg/kg	
7440393 Barium	23.9	mg/kg	
7440417 Beryllium	0.919	mg/kg	
7440439 Cadmium	0.20	mg/kg	U
7440702 Calcium	378	mg/kg	
7440473 Chromium	86.5	mg/kg	
7440484 Cobalt	8.77	mg/kg	
7440508 Copper	109	mg/kg	
7439896 Iron	45400	mg/kg	
7439954 Magnesium	257	mg/kg	
7439965 Manganese	307	mg/kg	
7440020 Nickel	24.2	mg/kg	
7440097 Potassium	70	mg/kg	U
7440224 Silver	0.40	mg/kg	UJ
7440235 Sodium	158	mg/kg	
7440622 Vanadium	120	mg/kg	
7440666 Zinc	36.4	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364136
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT01SB		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	4.11	mg/kg	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	Aluminum	6840	mg/kg	
	7440382	Arsenic	56.7	mg/kg	
	7440393	Barium	16.9	mg/kg	
	7440417	Beryllium	1.07	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	Calcium	639	mg/kg	
	7440473	Chromium	12.0	mg/kg	
	7440484	Cobalt	17.7	mg/kg	
	7440508	Copper	49.7	mg/kg	
	7439896	Iron	60100	mg/kg	
	7439954	Magnesium	156	mg/kg	
	7439965	Manganese	227	mg/kg	
	7440020	Nickel	9.21	mg/kg	
	7440097	Potassium	110	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	Sodium	19.4	mg/kg	
	7440622	Vanadium	173	mg/kg	
	7440666	Zinc	99.5	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364137
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT02SB		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**11.3**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**15800**	**mg/kg**	
	7440360	Antimony	9.0	mg/kg	~~UJ~~ L UJK
	7440382	**Arsenic**	**239**	**mg/kg**	
	7440393	**Barium**	**9.26**	**mg/kg**	
	7440417	**Beryllium**	**0.997**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**249**	**mg/kg**	
	7440473	**Chromium**	**52.6**	**mg/kg**	
	7440484	**Cobalt**	**13.6**	**mg/kg**	
	7440508	**Copper**	**51.5**	**mg/kg**	
	7439896	**Iron**	**72800**	**mg/kg**	
	7439954	**Magnesium**	**150**	**mg/kg**	
	7439965	**Manganese**	**395**	**mg/kg**	
	7440020	**Nickel**	**26.3**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	Sodium	18.5	mg/kg	U
	7440622	**Vanadium**	**109**	**mg/kg**	
	7440666	**Zinc**	**44.7**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364138
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT03SB		

			Result	Units	Qlfr
MET					
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	Aluminum	74800	mg/kg	
	7440382	Arsenic	356	mg/kg	
	7440393	Barium	10.9	mg/kg	
	7440417	Beryllium	1.10	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	Calcium	636	mg/kg	
	7440473	Chromium	114	mg/kg	
	7440484	Cobalt	20.6	mg/kg	
	7440508	Copper	120	mg/kg	
	7439896	Iron	67400	mg/kg	
	7439965	Manganese	635	mg/kg	
	7440020	Nickel	45.4	mg/kg	
	7440097	Potassium	100	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	Sodium	171	mg/kg	
	7440622	Vanadium	130	mg/kg	
	7440666	Zinc	70.3	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364139
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT04SB		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**7.44**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**64400**	**mg/kg**	
	7440382	**Arsenic**	**338**	**mg/kg**	
	7440393	**Barium**	**17.3**	**mg/kg**	
	7440417	**Beryllium**	**1.11**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**269**	**mg/kg**	
	7440473	**Chromium**	**79.5**	**mg/kg**	
	7440484	**Cobalt**	**10.7**	**mg/kg**	
	7440508	**Copper**	**93.8**	**mg/kg**	
	7439896	**Iron**	**54000**	**mg/kg**	
	7439954	**Magnesium**	**173**	**mg/kg**	
	7439965	**Manganese**	**218**	**mg/kg**	
	7440020	**Nickel**	**29.1**	**mg/kg**	
	7440097	**Potassium**	**84**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**122**	**mg/kg**	
	7440622	**Vanadium**	**113**	**mg/kg**	
	7440666	**Zinc**	**33.3**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364140
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT05SB		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**7.30**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ L
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**81400**	**mg/kg**	
	7440382	**Arsenic**	**143**	**mg/kg**	
	7440393	**Barium**	**10.2**	**mg/kg**	
	7440417	**Beryllium**	**1.17**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**948**	**mg/kg**	
	7440473	**Chromium**	**135**	**mg/kg**	
	7440484	**Cobalt**	**34.4**	**mg/kg**	
	7440508	**Copper**	**118**	**mg/kg**	
	7439896	**Iron**	**71500**	**mg/kg**	
	7439954	**Magnesium**	**967**	**mg/kg**	
	7439965	**Manganese**	**1920**	**mg/kg**	
	7440020	**Nickel**	**47.5**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**208**	**mg/kg**	
	7440622	**Vanadium**	**127**	**mg/kg**	
	7440666	**Zinc**	**99.1**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364141
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98-BB-MT06SB		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	**12.1**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJL
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJL
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**78000**	**mg/kg**	
	7440360	Antimony	11	mg/kg	~~UJ~~ UJK
	7440382	**Arsenic**	**330**	**mg/kg**	
	7440393	**Barium**	**68.0**	**mg/kg**	
	7440417	**Beryllium**	**1.02**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**157**	**mg/kg**	
	7440473	**Chromium**	**84.7**	**mg/kg**	
	7440484	**Cobalt**	**5.80**	**mg/kg**	
	7440508	**Copper**	**109**	**mg/kg**	
	7439896	**Iron**	**42800**	**mg/kg**	
	7439954	**Magnesium**	**121**	**mg/kg**	
	7439965	**Manganese**	**183**	**mg/kg**	
	7440020	**Nickel**	**20.9**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJL
	7440235	**Sodium**	**163**	**mg/kg**	
	7440622	**Vanadium**	**128**	**mg/kg**	
	7440666	**Zinc**	**35.0**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364142
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK01 SS		

MET

			Result	Units	Qlfr
Parameter :	Lead by AA, RAS				
Method :	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method:	ILM04.0				
Analytes :	**7439921**	**Lead**	**17.6**	**mg/kg**	
Parameter :	Selenium by AA, RAS				
Method :	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method:	ILM04.0				
Analytes :	**7782492**	**Selenium**	**1.4**	**mg/kg**	J L
Parameter :	Thallium by AA, RAS				
Method :	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method:	ILM04.0				
Analytes :	7440280	Thallium			R
Parameter :	Metals, ICP-SAS				
Method :	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method:	ILM04.0				
Analytes :	**7429905**	**Aluminum**	**18400**	**mg/kg**	
	7440360	Antimony	16	mg/kg	UJ k
	7440382	**Arsenic**	**270**	**mg/kg**	
	7440393	**Barium**	**21.1**	**mg/kg**	
	7440417	**Beryllium**	**0.42**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**4250**	**mg/kg**	
	7440473	**Chromium**	**51.8**	**mg/kg**	
	7440484	**Cobalt**	**15.5**	**mg/kg**	
	7440508	**Copper**	**122**	**mg/kg**	
	7439896	**Iron**	**51000**	**mg/kg**	
	7439921	**Lead**	**21.2**	**mg/kg**	
	7439954	**Magnesium**	**2370**	**mg/kg**	
	7439965	**Manganese**	**635**	**mg/kg**	
	7440020	**Nickel**	**36.7**	**mg/kg**	
	7440097	**Potassium**	**74**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**109**	**mg/kg**	
	7440622	**Vanadium**	**85.3**	**mg/kg**	
	7440666	**Zinc**	**926**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364143
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK02 SS		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**17.2**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**3420**	**mg/kg**	
	7440360	Antimony	25.6	mg/kg	UJ K
	7440382	**Arsenic**	**145**	**mg/kg**	
	7440393	**Barium**	**10.3**	**mg/kg**	
	7440417	**Beryllium**	**0.594**	**mg/kg**	
	7440439	**Cadmium**	**0.37**	**mg/kg**	
	7440702	**Calcium**	**2390**	**mg/kg**	
	7440473	**Chromium**	**44.3**	**mg/kg**	
	7440484	**Cobalt**	**24.5**	**mg/kg**	
	7440508	**Copper**	**137**	**mg/kg**	
	7439896	**Iron**	**54400**	**mg/kg**	
	7439921	**Lead**	**17.9**	**mg/kg**	
	7439954	**Magnesium**	**1200**	**mg/kg**	
	7439965	**Manganese**	**1190**	**mg/kg**	
	7440020	**Nickel**	**34.5**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**25.9**	**mg/kg**	
	7440622	**Vanadium**	**92.7**	**mg/kg**	
	7440666	**Zinc**	**1170**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364144
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK03 SS		

MET

			Result	Units	Qlfr
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum	9420	mg/kg	
	7440360	Antimony	37.1	mg/kg	UJ K
	7440382	Arsenic	153	mg/kg	
	7440393	Barium	22.4	mg/kg	
	7440417	Beryllium	0.568	mg/kg	
	7440439	Cadmium	1.92	mg/kg	
	7440702	Calcium	1940	mg/kg	
	7440473	Chromium	54.0	mg/kg	
	7440484	Cobalt	23.1	mg/kg	
	7440508	Copper	170	mg/kg	
	7439896	Iron	71300	mg/kg	
	7439921	Lead	57.4	mg/kg	
	7439954	Magnesium	1050	mg/kg	
	7439965	Manganese	1180	mg/kg	
	7440020	Nickel	39.5	mg/kg	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	J L
	7440235	Sodium	46.7	mg/kg	
	7440622	Vanadium	91.8	mg/kg	
	7440666	Zinc	2330	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364145
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK04 SS		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	**18.6**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	**Selenium**	**0.67**	**mg/kg**	J L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	**Aluminum**	**2370**	**mg/kg**	
	7440360	Antimony	33.2	mg/kg	UJ K
	7440382	**Arsenic**	**952**	**mg/kg**	
	7440393	**Barium**	**3.39**	**mg/kg**	
	7440417	**Beryllium**	**1.46**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**35.9**	**mg/kg**	
	7440473	**Chromium**	**858**	**mg/kg**	
	7440484	**Cobalt**	**42.7**	**mg/kg**	
	7440508	**Copper**	**535**	**mg/kg**	
	7439896	**Iron**	**372000**	**mg/kg**	
	7439921	**Lead**	**17.8**	**mg/kg**	
	7439954	**Magnesium**	**77.1**	**mg/kg**	
	7439965	**Manganese**	**426**	**mg/kg**	
	7440020	**Nickel**	**188**	**mg/kg**	
	7440097	**Potassium**	**73**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	Sodium	14.1	mg/kg	U
	7440622	**Vanadium**	**682**	**mg/kg**	
	7440666	Zinc	**29.6**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364146
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK05 SS		

MET

			Result	Units	Qlfr
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	**Aluminum**	**34900**	**mg/kg**	
	7440360	Antimony	20.4	mg/kg	UJ K
	7440382	**Arsenic**	**183**	**mg/kg**	
	7440393	**Barium**	**36.0**	**mg/kg**	
	7440417	**Beryllium**	**0.673**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3610**	**mg/kg**	
	7440473	**Chromium**	**62.3**	**mg/kg**	
	7440484	**Cobalt**	**18.4**	**mg/kg**	
	7440508	**Copper**	**138**	**mg/kg**	
	7439896	**Iron**	**47800**	**mg/kg**	
	7439921	**Lead**	**31.1**	**mg/kg**	
	7439954	**Magnesium**	**1460**	**mg/kg**	
	7439965	**Manganese**	**915**	**mg/kg**	
	7440020	**Nickel**	**31.0**	**mg/kg**	
	7440097	**Potassium**	**258**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**804**	**mg/kg**	
	7440622	**Vanadium**	**88.8**	**mg/kg**	
	7440666	**Zinc**	**454**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364147
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98-BB-MK06 SS		

			Result	Units	Qlfr
MET					
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**36200**	**mg/kg**	
	7440360	Antimony	4.5	mg/kg	UJ K
	7440382	**Arsenic**	**114**	**mg/kg**	
	7440393	**Barium**	**82.7**	**mg/kg**	
	7440417	**Beryllium**	**0.769**	**mg/kg**	
	7440439	**Cadmium**	**0.20**	**mg/kg**	
	7440702	**Calcium**	**2950**	**mg/kg**	
	7440473	**Chromium**	**49.3**	**mg/kg**	
	7440484	**Cobalt**	**12.5**	**mg/kg**	
	7440508	**Copper**	**113**	**mg/kg**	
	7439896	**Iron**	**42800**	**mg/kg**	
	7439921	**Lead**	**57.5**	**mg/kg**	
	7439954	**Magnesium**	**2210**	**mg/kg**	
	7439965	**Manganese**	**483**	**mg/kg**	
	7440020	**Nickel**	**23.0**	**mg/kg**	
	7440097	**Potassium**	**548**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**542**	**mg/kg**	
	7440622	**Vanadium**	**95.9**	**mg/kg**	
	7440666	**Zinc**	**276**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364148
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK01SB		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**9.71**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**29300**	**mg/kg**	
	7440360	Antimony	17	mg/kg	UJ K
	7440382	**Arsenic**	**173**	**mg/kg**	
	7440393	**Barium**	**53.4**	**mg/kg**	
	7440417	**Beryllium**	**0.588**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**4920**	**mg/kg**	
	7440473	**Chromium**	**45.5**	**mg/kg**	
	7440484	**Cobalt**	**10.8**	**mg/kg**	
	7440508	**Copper**	**67.5**	**mg/kg**	
	7439896	**Iron**	**35900**	**mg/kg**	
	7439954	**Magnesium**	**2160**	**mg/kg**	
	7439965	**Manganese**	**481**	**mg/kg**	
	7440020	**Nickel**	**26.4**	**mg/kg**	
	7440097	**Potassium**	**370**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**109**	**mg/kg**	
	7440622	**Vanadium**	**101**	**mg/kg**	
	7440666	**Zinc**	**85.3**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364149
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98-BB-MK02SB		

			Result	Units	Qlfr
MET					
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	U JL
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum	27000	mg/kg	
	7440360	Antimony	7.6	mg/kg	UJ K
	7440382	Arsenic	102	mg/kg	
	7440393	Barium	125	mg/kg	
	7440417	Beryllium	0.49	mg/kg	
	7440439	Cadmium	0.21	mg/kg	
	7440702	Calcium	3600	mg/kg	
	7440473	Chromium	44.5	mg/kg	
	7440484	Cobalt	9.36	mg/kg	
	7440508	Copper	75.6	mg/kg	
	7439896	Iron	72000	mg/kg	
	7439921	Lead	34.4	mg/kg	
	7439954	Magnesium	1580	mg/kg	
	7439965	Manganese	313	mg/kg	
	7440020	Nickel	25.7	mg/kg	
	7440097	Potassium	1080	mg/kg	
	7440224	Silver	0.54	mg/kg	J L
	7440235	Sodium	815	mg/kg	
	7440622	Vanadium	69.4	mg/kg	
	7440666	Zinc	244	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364150
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK03SB		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	**8.60**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.30	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**46800**	**mg/kg**	
	7440360	Antimony	14	mg/kg	UJ K
	7440382	**Arsenic**	**132**	**mg/kg**	
	7440393	**Barium**	**20.9**	**mg/kg**	
	7440417	**Beryllium**	**0.782**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**5430**	**mg/kg**	
	7440473	**Chromium**	**77.0**	**mg/kg**	
	7440484	**Cobalt**	**24.9**	**mg/kg**	
	7440508	**Copper**	**126**	**mg/kg**	
	7439896	**Iron**	**53900**	**mg/kg**	
	7439954	**Magnesium**	**3340**	**mg/kg**	
	7439965	**Manganese**	**1280**	**mg/kg**	
	7440020	**Nickel**	**41.0**	**mg/kg**	
	7440097	**Potassium**	**160**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**318**	**mg/kg**	
	7440622	**Vanadium**	**121**	**mg/kg**	
	7440666	**Zinc**	**139**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK04SB - MS		

MET

			Result	Units	Qlfr
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	**Aluminum**	41300	mg/kg	
	7440360	Antimony	15	mg/kg	UJ K
	7440382	**Arsenic**	135	mg/kg	
	7440393	**Barium**	62.0	mg/kg	
	7440417	**Beryllium**	0.842	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	2540	mg/kg	
	7440473	**Chromium**	57.9	mg/kg	
	7440484	**Cobalt**	18.1	mg/kg	
	7440508	**Copper**	153	mg/kg	
	7439896	**Iron**	54900	mg/kg	
	7439921	**Lead**	51.7	mg/kg	
	7439954	**Magnesium**	1990	mg/kg	
	7439965	**Manganese**	675	mg/kg	
	7440020	**Nickel**	32.7	mg/kg	
	7440097	**Potassium**	337	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	166	mg/kg	
	7440622	**Vanadium**	114	mg/kg	
	7440666	**Zinc**	307	mg/kg	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum	38900	mg/kg	
	7440360	Antimony	6.8	mg/kg	UJ K
	7440382	Arsenic	140	mg/kg	
	7440393	Barium	74.2	mg/kg	
	7440417	Beryllium	0.794	mg/kg	
	7440439	Cadmium	0.33	mg/kg	
	7440702	Calcium	2420	mg/kg	
	7440473	Chromium	51.8	mg/kg	
	7440484	Cobalt	16.9	mg/kg	
	7440508	Copper	132	mg/kg	
	7439896	Iron	48000	mg/kg	
	7439921	Lead	52.8	mg/kg	
	7439954	Magnesium	1780	mg/kg	
	7439965	Manganese	628	mg/kg	
	7440020	Nickel	28.4	mg/kg	
	7440097	Potassium	265	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	Sodium	166	mg/kg	
	7440622	Vanadium	99.6	mg/kg	
	7440666	Zinc	277	mg/kg	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	49	%Rec	
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	3	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum			NA
	7440702	Calcium			NA
	7439896	Iron			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7440360	Antimony	35	%Rec	
	7440382	Arsenic	92	%Rec	
	7440393	Barium	93	%Rec	
	7440417	Beryllium	101	%Rec	
	7440439	Cadmium	96	%Rec	
	7440473	Chromium	95	%Rec	
	7440484	Cobalt	93	%Rec	
	7440508	Copper	109	%Rec	
	7439921	Lead	100	%Rec	
	7439965	Manganese	93	%Rec	
	7440020	Nickel	95	%Rec	
	7440224	Silver	96	%Rec	
	7440622	Vanadium	99	%Rec	
	7440666	Zinc	92	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

MET

			Result	Units	Qlfr
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	54	%Rec	
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	1	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum			NA
	7440702	Calcium			NA
	7439896	Iron			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7440360	Antimony	45	%Rec	
	7440382	Arsenic	89	%Rec	
	7440393	Barium	93	%Rec	
	7440417	Beryllium	101	%Rec	
	7440439	Cadmium	96	%Rec	
	7440473	Chromium	86	%Rec	
	7440484	Cobalt	92	%Rec	
	7440508	Copper	68	%Rec	
	7439921	Lead	94	%Rec	
	7439965	Manganese	58	%Rec	
	7440020	Nickel	94	%Rec	
	7440224	Silver	95	%Rec	
	7440622	Vanadium	93	%Rec	
	7440666	Zinc	71	%Rec	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364152
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB BG01SS		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**5.11**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.30	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**20600**	**mg/kg**	
	7440360	Antimony	7.7	mg/kg	UJ K
	7440382	**Arsenic**	**68.5**	**mg/kg**	
	7440393	**Barium**	**103**	**mg/kg**	
	7440417	**Beryllium**	**0.972**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**1880**	**mg/kg**	
	7440473	**Chromium**	**48.4**	**mg/kg**	
	7440484	**Cobalt**	**21.6**	**mg/kg**	
	7440508	**Copper**	**84.2**	**mg/kg**	
	7439896	**Iron**	**50800**	**mg/kg**	
	7439954	**Magnesium**	**1510**	**mg/kg**	
	7439965	**Manganese**	**1530**	**mg/kg**	
	7440020	**Nickel**	**29.4**	**mg/kg**	
	7440097	**Potassium**	**305**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	**75.3**	**mg/kg**	
	7440622	**Vanadium**	**133**	**mg/kg**	
	7440666	**Zinc**	**83.8**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364153
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB BG02SS		

MET

			Result	Units	Qlfr
Parameter	: Arsenic by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440382	Arsenic	18.8	mg/kg	J L
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	9.74	mg/kg	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.30	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum	37900	mg/kg	
	7440360	Antimony	4.5	mg/kg	UJ K
	7440393	Barium	281	mg/kg	
	7440417	Beryllium	1.29	mg/kg	
	7440439	Cadmium	0.23	mg/kg	
	7440702	Calcium	6440	mg/kg	
	7440473	Chromium	61.4	mg/kg	
	7440484	Cobalt	34.0	mg/kg	
	7440508	Copper	120	mg/kg	
	7439896	Iron	68600	mg/kg	
	7439954	Magnesium	1820	mg/kg	
	7439965	Manganese	3520	mg/kg	
	7440020	Nickel	28.9	mg/kg	
	7440097	Potassium	1050	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	Sodium	71.6	mg/kg	
	7440622	Vanadium	184	mg/kg	

Report by Parameter for Project TEC-723A

			Result	Units	Qlfr
Analytes	: 7440666	Zinc	105	mg/kg	

98364153 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364154
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB BG01SB		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	**Lead**	4.93	mg/kg	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ L
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	**Aluminum**	18700	mg/kg	
	7440360	Antimony	4.5	mg/kg	~~UJK~~ UJK
	7440382	**Arsenic**	69.4	mg/kg	
	7440393	**Barium**	100	mg/kg	
	7440417	**Beryllium**	0.973	mg/kg	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	2080	mg/kg	
	7440473	**Chromium**	45.8	mg/kg	
	7440484	**Cobalt**	20.8	mg/kg	
	7440508	**Copper**	79.5	mg/kg	
	7439896	**Iron**	49000	mg/kg	
	7439954	**Magnesium**	1470	mg/kg	
	7439965	**Manganese**	1470	mg/kg	
	7440020	**Nickel**	27.6	mg/kg	
	7440097	**Potassium**	242	mg/kg	
	7440224	Silver	0.40	mg/kg	UJ L
	7440235	**Sodium**	68.8	mg/kg	
	7440622	**Vanadium**	130	mg/kg	
	7440666	**Zinc**	84.7	mg/kg	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980925A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	0.10	mg/kg	U
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.20	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.20	mg/kg	U
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum	2.0	mg/kg	U
	7440360	Antimony	4.5	mg/kg	U
	7440382	Arsenic	4.0	mg/kg	U
	7440393	Barium	0.10	mg/kg	U
	7440417	Beryllium	0.10	mg/kg	U
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3.37**	**mg/kg**	
	7440473	Chromium	0.50	mg/kg	U
	7440484	Cobalt	0.50	mg/kg	U
	7440508	Copper	0.30	mg/kg	U
	7439896	Iron	1.0	mg/kg	U
	7439954	Magnesium	2.0	mg/kg	U
	7439965	Manganese	0.10	mg/kg	U
	7440020	Nickel	1.0	mg/kg	U
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	U
	7440235	**Sodium**	**3.8**	**mg/kg**	
	7440622	Vanadium	0.30	mg/kg	U
	7440666	Zinc	0.40	mg/kg	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980925A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Spike Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	91	%Rec	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	92	%Rec	
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	88	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440702	Calcium			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7429905	Aluminum	98	%Rec	
	7440360	Antimony	101	%Rec	
	7440382	Arsenic	95	%Rec	
	7440393	Barium	95	%Rec	
	7440417	Beryllium	100	%Rec	
	7440439	Cadmium	95	%Rec	
	7440473	Chromium	97	%Rec	
	7440484	Cobalt	96	%Rec	
	7440508	Copper	95	%Rec	
	7439896	Iron	98	%Rec	
	7439921	Lead	93	%Rec	
	7439965	Manganese	96	%Rec	
	7440020	Nickel	98	%Rec	
	7440224	Silver	94	%Rec	
	7440622	Vanadium	99	%Rec	
	7440666	Zinc	97	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980929A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Arsenic by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440382	Arsenic	0.10	mg/kg	U
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	0.1	mg/kg	U
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.20	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.20	mg/kg	U
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum	2.0	mg/kg	U
	7440360	Antimony	4.5	mg/kg	U
	7440382	Arsenic	4.0	mg/kg	U
	7440393	Barium	0.10	mg/kg	U
	7440417	Beryllium	0.10	mg/kg	U
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**2.39**	**mg/kg**	
	7440473	Chromium	0.50	mg/kg	U
	7440484	Cobalt	0.50	mg/kg	U
	7440508	Copper	0.30	mg/kg	U
	7439896	**Iron**	**1.6**	**mg/kg**	
	7439954	Magnesium	2.0	mg/kg	U
	7439965	Manganese	0.10	mg/kg	U
	7440020	Nickel	1.0	mg/kg	U
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**4.7**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	0.30	mg/kg	U
	7440666	Zinc	0.40	mg/kg	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980929A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Spike Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Arsenic by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440382	Arsenic	110	%Rec	
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	89	%Rec	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	95	%Rec	
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	95	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440702	Calcium			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7429905	Aluminum	97	%Rec	
	7440360	Antimony	100	%Rec	
	7440382	Arsenic	95	%Rec	
	7440393	Barium	94	%Rec	
	7440417	Beryllium	99	%Rec	
	7440439	Cadmium	95	%Rec	
	7440473	Chromium	98	%Rec	
	7440484	Cobalt	96	%Rec	
	7440508	Copper	95	%Rec	
	7439896	Iron	98	%Rec	
	7439921	Lead	100	%Rec	
	7439965	Manganese	96	%Rec	
	7440020	Nickel	99	%Rec	

XS980929A Spike Blank

			Result	Units	Qlfr
Analytes	: 7440224	Silver	94	%Rec	
	7440622	Vanadium	101	%Rec	
	7440666	Zinc	98	%Rec	

Manchester Environmental Laboratory

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364122
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98-BB-GC-01-SD		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	0.978 JH	mg/kg	N

Sent to-
Mark Ader
Bill Richards

98364122 Reg sample
12/30/98 CM

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364123
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 01 SD		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	3.85 JA	mg/kg	N

98364123 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364124
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB GC 02 SD		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	0.932 JH	mg/kg	N

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC02 SD - MS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	5.61 JH	mg/kg	N

98364125 Reg sample

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	5.05	mg/kg	N

98364125 Duplicate

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	177	%Rec	

98364125 Matrix Spike

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	156	%Rec	

98364125 Matrix Spike Du

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364126
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 03 SD		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	48.0 JH	mg/kg	N

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364127
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98-BB-DC-04-SD		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	1.22 JH	mg/kg	N

98364127 Reg sample

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364128
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 05 SD		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	1.41 JH	mg/kg	N

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364129
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MA01SD		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**21.0** JH	**mg/kg**	**N**

98364129 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364130
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT01SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	0.383	mg/kg	

98364130 Reg sample

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364131
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT02SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**11.8**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364132
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT03SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	2.62	mg/kg	

98364132 Reg sample

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364133
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT04SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	3.44	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364134
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT05SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	5.99	mg/kg	

98364134 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364135
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT06SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**1.12**	**mg/kg**	

98364135 Reg sample

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364135
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**1.22**	**mg/kg**	

98364135 Duplicate

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364135
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	92.3	%Rec	

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364135
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	101	%Rec	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364136
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT01SB		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**0.11**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364137
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT02SB		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**148**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364138
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT03SB		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**5.44**	**mg/kg**	

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364139
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT04SB		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	3.66	mg/kg	

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364140
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT05SB		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**2.04**	**mg/kg**	

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364141
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT06SB		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**1.18**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364142
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK01 SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**2550**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364143
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK02 SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**1800**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364144
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK03 SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**2390**	**mg/kg**	

98364144 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364145
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK04 SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	54300	mg/kg	

Report by Parameter for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364146
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK05 SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**359**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364147
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK06 SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**174**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364148
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK01SB		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**397**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364149
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK02SB		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**237**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364150
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK03SB		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**91.9**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK04SB - MS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**264**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	277	**mg/kg**	

98364151 Duplicate

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

	Result	Units	Qlfr
MET			
Parameter : All MERCURY tests			
Method : 245.5 Mercury, Cold Vapor, Manual, Sediments			
Prep Method: 245.5 Determination of Mercury in Sediments by			
Analytes : 7439976 Mercury			NA

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury			NA

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364152
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB BG01SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	15.2	**mg/kg**	

98364152 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364153
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB BG02SS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**5.48**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364154
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB BG01SB		

			Result		Units	Qlfr
MET						
Parameter	: All MERCURY tests					
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments				
Prep Method	: 245.5	Determination of Mercury in Sediments by				
Analytes	: 7439976	**Mercury**	**11.1**	JK	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980921A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	0.10	mg/kg	U

XS980921A Blank

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980921A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	96.5	%Rec	

XS980921A Control

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980921B
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	0.10	mg/kg	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980921B
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	101	%Rec	

XS980921B Control

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980928A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**1.75**	**mg/kg**	

XS980928A Blank

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980928A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury			NA

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980930A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	0.10	mg/kg	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980930A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	97.2	%Rec	

ecology and environment, inc.
International Specialists in the Environment

1500 First Interstate Center, 999 Third Avenue
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: February 10, 1999

TO: Bill Richards, Project Manager, E & E, Seattle, WA

FROM: Mark Woodke, START-Chemist, E & E, Seattle, WA MW

SUBJ: **Inorganic Data Quality Assurance Summary Check, Black Butte Mine Site, Cottage Grove, Oregon**

REF: TDD: 98-04-0004 PAN: CD0401SIDM

The data quality assurance summary check of 21 water samples collected from the Black Butte Mine site located near Cottage Grove, Oregon, has been completed. Target Analyte List (TAL) Metals analyses (EPA CLP SOW Method ILMO4.0) was performed at the Manchester Environmental Laboratory, Port Orchard, Washington.

The following discrepancies were noted:

The review memorandum lists the analysis method as EPA CLP SOW ILMO4.0 while the data sheets list method ILM3.0. The original data reviewer stated that the correct method is ILMO4.0 and that the data sheets are incorrect due to software inconsistencies. No action was taken based on this discrepancy.

Several samples had two listed results for lead; revised sample results were received from the laboratory on February 5, 1999.

recycled paper

Manchester Environmental Laboratory

Combined Final Report for Project TEC-723A

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364100
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW01 GW MS		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	0.20	ug/L	U
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: 200.8 MOD				
Analytes	: 7429905	Aluminum	25	ug/L	U
	7440393	**Barium**	**10.6**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**15800**	**ug/L**	
	7440473	Chromium	6.3	ug/L	U
	7440484	Cobalt	6.3	ug/L	U
	7440508	**Copper**	**3.8**	**ug/L**	
	7439896	**Iron**	**71.5**	**ug/L**	
	7439954	**Magnesium**	**4270**	**ug/L**	
	7439965	**Manganese**	**10.6**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**6780**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**9.1**	**ug/L**	
Parameter	: Metals, ICP/MS				
Method	: 200.8 MOD				
Prep Method	: 200.8 MOD				
Analytes	: 7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**2.3**	**ug/L**	
	7439921	**Lead**	**4.55**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Revised

Sent to-
Mark Ader
Bill Richards

0193

98364100 Reg sample
2/4/99 SH

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364100
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**33**	**ug/L**	
	7440393	**Barium**	**10.7**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**15800**	**ug/L**	
	7440473	Chromium	6.3	ug/L	U
	7440484	Cobalt	6.3	ug/L	U
	7440508	**Copper**	**4.3**	**ug/L**	
	7439896	**Iron**	**74.6**	**ug/L**	
	7439954	**Magnesium**	**4280**	**ug/L**	
	7439965	**Manganese**	**10.5**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**6780**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**11**	**ug/L**	
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**2.3**	**ug/L**	
	7439921	**Lead**	**4.64**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364100
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	106	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: 200.8 MOD				
Analytes	: 7440702	Calcium			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7429905	Aluminum	104	%Rec	
	7440393	Barium	100	%Rec	
	7440417	Beryllium	104	%Rec	
	7440439	Cadmium	98	%Rec	
	7440473	Chromium	104	%Rec	
	7440484	Cobalt	101	%Rec	
	7440508	Copper	100	%Rec	
	7439896	Iron	103	%Rec	
	7439965	Manganese	101	%Rec	
	7440020	Nickel	103	%Rec	
	7440622	Vanadium	106	%Rec	
	7440666	Zinc	101	%Rec	
Parameter	: Metals, ICP/MS				
Method	: 200.8 MOD				
Prep Method	: 200.8 MOD				
Analytes	: 7440360	Antimony	100	%Rec	
	7440382	Arsenic	98	%Rec	
	7439921	Lead	97	%Rec	
	7782492	Selenium	98	%Rec	
	7440224	Silver	99	%Rec	
	7440280	Thallium	96	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364100
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	104	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: 200.8 MOD				
Analytes	: 7440702	Calcium			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7429905	Aluminum	104	%Rec	
	7440393	Barium	101	%Rec	
	7440417	Beryllium	105	%Rec	
	7440439	Cadmium	96	%Rec	
	7440473	Chromium	104	%Rec	
	7440484	Cobalt	99	%Rec	
	7440508	Copper	100	%Rec	
	7439896	Iron	104	%Rec	
	7439965	Manganese	101	%Rec	
	7440020	Nickel	103	%Rec	
	7440622	Vanadium	106	%Rec	
	7440666	Zinc	102	%Rec	
Parameter	: Metals, ICP/MS				
Method	: 200.8 MOD				
Prep Method	: 200.8 MOD				
Analytes	: 7440360	Antimony	104	%Rec	
	7440382	Arsenic	102	%Rec	
	7439921	Lead	101	%Rec	
	7782492	Selenium	100	%Rec	
	7440224	Silver	102	%Rec	
	7440280	Thallium	100	%Rec	

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364101
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW02 GW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**89**	**ug/L**	
	7440393	**Barium**	**55.5**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**31600**	**ug/L**	
	7440473	**Chromium**	**30.2**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**131**	**ug/L**	
	7439954	**Magnesium**	**7640**	**ug/L**	
	7439965	**Manganese**	**3.5**	**ug/L**	
	7440020	**Nickel**	**13**	**ug/L**	
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**10600**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**6.3**	**ug/L**	
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**2.5**	**ug/L**	
	7439921	**Lead**	**0.30**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364102
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW03 GW		

MET

Parameter : All MERCURY tests
Method : 245.1 Cold vapor mercury in water
Prep Method: 245.1 Determination of Mercury in Water by Col

			Result	Units	Qlfr
Analytes	7439976	Mercury	0.20	ug/L	U

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8 MOD

			Result	Units	Qlfr
Analytes	**7429905**	**Aluminum**	**386**	**ug/L**	
	7440393	**Barium**	**5.7**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**18000**	**ug/L**	
	7440473	**Chromium**	**28.2**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	**Copper**	**6.6**	**ug/L**	
	7439896	**Iron**	**4130**	**ug/L**	
	7439954	**Magnesium**	**2950**	**ug/L**	
	7439965	**Manganese**	**34.6**	**ug/L**	
	7440020	**Nickel**	**18**	**ug/L**	
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**7140**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**14**	**ug/L**	

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

			Result	Units	Qlfr
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**3.8**	**ug/L**	
	7439921	**Lead**	**0.97**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364103
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW04 GW		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	0.20	ug/L	U
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: 200.8 MOD				
Analytes	: **7429905**	**Aluminum**	**73**	**ug/L**	
	7440393	**Barium**	**274**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**16800**	**ug/L**	
	7440473	**Chromium**	**21**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**273**	**ug/L**	
	7439954	**Magnesium**	**3560**	**ug/L**	
	7439965	**Manganese**	**4.7**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	**Potassium**	**2520**	**ug/L**	
	7440235	**Sodium**	**301000**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	: Metals, ICP/MS				
Method	: 200.8 MOD				
Prep Method	: 200.8 MOD				
Analytes	: 7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**93.9**	**ug/L**	
	7439921	Lead	0.13	ug/L	U
	7782492	**Selenium**	**1.6**	**ug/L**	
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364104
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW05 GW		

			Result	Units	Qlfr
MET					
Parameter :	All MERCURY tests				
Method :	245.1	Cold vapor mercury in water			
Prep Method:	245.1	Determination of Mercury in Water by Col			
Analytes :	7439976	Mercury	0.20	ug/L	U
Parameter :	Metals, ICP-SAS				
Method :	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method:	200.8 MOD				
Analytes :	**7429905**	**Aluminum**	**63**	**ug/L**	
	7440393	**Barium**	**30.6**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**4920**	**ug/L**	
	7440473	**Chromium**	**17**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**245**	**ug/L**	
	7439954	**Magnesium**	**1110**	**ug/L**	
	7439965	**Manganese**	**58.0**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**62600**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter :	Metals, ICP/MS				
Method :	200.8 MOD				
Prep Method:	200.8 MOD				
Analytes :	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**32.2**	**ug/L**	
	7439921	Lead	0.13	ug/L	U
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364105
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW06 GW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**44**	**ug/L**	
	7440393	**Barium**	**1.8**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**1030**	**ug/L**	
	7440473	**Chromium**	**6.7**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	**Copper**	**14.2**	**ug/L**	
	7439896	**Iron**	**27.9**	**ug/L**	
	7439954	**Magnesium**	**144**	**ug/L**	
	7439965	**Manganese**	**2.8**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**73900**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**12**	**ug/L**	
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**94.9**	**ug/L**	
	7439921	**Lead**	**0.81**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364106
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW07 GW		

MET

Parameter : All MERCURY tests
Method : 245.1 Cold vapor mercury in water
Prep Method: 245.1 Determination of Mercury in Water by Col

			Result	Units	Qlfr
Analytes	7439976	Mercury	0.20	ug/L	U

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8 MOD

			Result	Units	Qlfr
Analytes	**7429905**	**Aluminum**	**38**	**ug/L**	
	7440393	**Barium**	**12.2**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**11700**	**ug/L**	
	7440473	Chromium	6.3	ug/L	U
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**182**	**ug/L**	
	7439954	**Magnesium**	**2730**	**ug/L**	
	7439965	**Manganese**	**20.1**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**4770**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**91.2**	**ug/L**	

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

			Result	Units	Qlfr
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**2.7**	**ug/L**	
	7439921	**Lead**	**0.99**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364107
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW08 GW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**41**	**ug/L**	
	7440393	**Barium**	**672**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**51800**	**ug/L**	
	7440473	**Chromium**	**9.4**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**1100**	**ug/L**	
	7439954	**Magnesium**	**9340**	**ug/L**	
	7439965	**Manganese**	**92.9**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	**Potassium**	**3390**	**ug/L**	
	7440235	**Sodium**	**288000**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**7.9**	**ug/L**	
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**66.7**	**ug/L**	
	7439921	Lead	0.13	ug/L	U
	7782492	**Selenium**	**3.0**	**ug/L**	
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364108
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW09 GW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**45**	**ug/L**	
	7440393	**Barium**	**93.8**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**47100**	**ug/L**	
	7440473	**Chromium**	**8.1**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**632**	**ug/L**	
	7439954	**Magnesium**	**5290**	**ug/L**	
	7439965	**Manganese**	**91.3**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	**Potassium**	**1100**	**ug/L**	
	7440235	**Sodium**	**26700**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**124**	**ug/L**	
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**30.5**	**ug/L**	
	7439921	**Lead**	**0.50**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364108
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

MET

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8MOD

			Result	Units	Qlfr
Analytes	**7429905**	**Aluminum**	**45**	**ug/L**	
	7440393	**Barium**	**94.7**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**47400**	**ug/L**	
	7440473	**Chromium**	**7.8**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**638**	**ug/L**	
	7439954	**Magnesium**	**5340**	**ug/L**	
	7439965	**Manganese**	**91.4**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**27000**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**122**	**ug/L**	

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**31.1**	**ug/L**	
	7439921	**Lead**	**0.51**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364108
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

MET

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8 MOD

		Result	Units	Qlfr
Analytes	7440702 Calcium			NA
	7439954 Magnesium			NA
	7440097 Potassium			NA
	7440235 Sodium			NA
	7429905 Aluminum	103	%Rec	
	7440393 Barium	101	%Rec	
	7440417 Beryllium	105	%Rec	
	7440439 Cadmium	95	%Rec	
	7440473 Chromium	100	%Rec	
	7440484 Cobalt	100	%Rec	
	7440508 Copper	101	%Rec	
	7439896 Iron	103	%Rec	
	7439965 Manganese	100	%Rec	
	7440020 Nickel	104	%Rec	
	7440622 Vanadium	106	%Rec	
	7440666 Zinc	101	%Rec	

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

Analytes	7440360 Antimony	101	%Rec	
	7440382 Arsenic	99	%Rec	
	7439921 Lead	94	%Rec	
	7782492 Selenium	96	%Rec	
	7440224 Silver	95	%Rec	
	7440280 Thallium	93	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364108
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

MET

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8 MOD

			Result	Units	Qlfr
Analytes	7440702	Calcium			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7429905	Aluminum	103	%Rec	
	7440393	Barium	102	%Rec	
	7440417	Beryllium	106	%Rec	
	7440439	Cadmium	94	%Rec	
	7440473	Chromium	103	%Rec	
	7440484	Cobalt	100	%Rec	
	7440508	Copper	102	%Rec	
	7439896	Iron	104	%Rec	
	7439965	Manganese	101	%Rec	
	7440020	Nickel	105	%Rec	
	7440622	Vanadium	107	%Rec	
	7440666	Zinc	102	%Rec	

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

Analytes	7440360	Antimony	102	%Rec
	7440382	Arsenic	100	%Rec
	7439921	Lead	95	%Rec
	7782492	Selenium	98	%Rec
	7440224	Silver	96	%Rec
	7440280	Thallium	94	%Rec

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364109
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DW10 GW		

MET

			Result	Units	Qlfr
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	0.20	ug/L	U
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: 200.8MOD				
Analytes	: **7429905**	**Aluminum**	**74**	**ug/L**	
	7440393	**Barium**	**380**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**32100**	**ug/L**	
	7440473	Chromium	6.3	ug/L	U
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**25400**	**ug/L**	
	7439954	**Magnesium**	**7970**	**ug/L**	
	7439965	**Manganese**	**86.7**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	**Potassium**	**1500**	**ug/L**	
	7440235	**Sodium**	**27000**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**206**	**ug/L**	
Parameter	: Metals, ICP/MS				
Method	: 200.8 MOD				
Prep Method	: 200.8 MOD				
Analytes	: 7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**39.9**	**ug/L**	
	7439921	**Lead**	**3.69**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	**Silver**	**0.048**	**ug/L**	
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364112
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB SP01GW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**126**	**ug/L**	
	7440393	**Barium**	**12.6**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**11800**	**ug/L**	
	7440473	**Chromium**	**11**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**311**	**ug/L**	
	7439954	**Magnesium**	**2730**	**ug/L**	
	7439965	**Manganese**	**26.1**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**4800**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**11**	**ug/L**	
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**3.5**	**ug/L**	
	7439921	**Lead**	**0.16**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364113
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB GC01 SW		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	0.20	ug/L	U
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: 200.8 MOD				
Analytes	: **7429905**	**Aluminum**	**186**	**ug/L**	
	7440393	**Barium**	**8.56**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**13300**	**ug/L**	
	7440473	**Chromium**	**33.1**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**332**	**ug/L**	
	7439954	**Magnesium**	**2930**	**ug/L**	
	7439965	**Manganese**	**16.3**	**ug/L**	
	7440020	**Nickel**	**21**	**ug/L**	
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**5090**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	: Metals, ICP/MS				
Method	: 200.8 MOD				
Prep Method	: 200.8 MOD				
Analytes	: 7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**2.4**	**ug/L**	
	7439921	**Lead**	**0.14**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364114
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC01 SW		

MET

			Result	Units	Qlfr
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	0.20	ug/L	U
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: 200.8 MOD				
Analytes	: **7429905**	**Aluminum**	**175**	**ug/L**	
	7440393	**Barium**	**24.5**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**40000**	**ug/L**	
	7440473	**Chromium**	**47.0**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	**Copper**	**3.9**	**ug/L**	
	7439896	**Iron**	**244**	**ug/L**	
	7439954	**Magnesium**	**9850**	**ug/L**	
	7439965	**Manganese**	**13.1**	**ug/L**	
	7440020	**Nickel**	**22**	**ug/L**	
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**5160**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	: Metals, ICP/MS				
Method	: 200.8 MOD				
Prep Method	: 200.8 MOD				
Analytes	: **7440360**	**Antimony**	**1.1**	**ug/L**	
	7440382	**Arsenic**	**2.5**	**ug/L**	
	7439921	Lead	0.13	ug/L	U
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364115
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB GC02 SW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**120**	**ug/L**	
	7440393	**Barium**	**7.00**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**12800**	**ug/L**	
	7440473	**Chromium**	**25**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**232**	**ug/L**	
	7439954	**Magnesium**	**2790**	**ug/L**	
	7439965	**Manganese**	**9.68**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**5150**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**2.1**	**ug/L**	
	7439921	Lead	0.13	ug/L	U
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364116
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC02 SW MS		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8MOD				
Analytes	**7429905**	**Aluminum**	**37**	**ug/L**	
	7440393	**Barium**	**30.8**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**45300**	**ug/L**	
	7440473	Chromium	6.3	ug/L	U
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**57.6**	**ug/L**	
	7439954	**Magnesium**	**10600**	**ug/L**	
	7439965	**Manganese**	**10.9**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**4980**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**0.86**	**ug/L**	
	7439921	**Lead**	**0.20**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364116
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8MOD				
Analytes	**7429905**	**Aluminum**	**41**	**ug/L**	
	7440393	**Barium**	**30.1**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**45100**	**ug/L**	
	7440473	Chromium	6.3	ug/L	U
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**58.5**	**ug/L**	
	7439954	**Magnesium**	**10500**	**ug/L**	
	7439965	**Manganese**	**10.4**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**4930**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**1.4**	**ug/L**	
	7439921	Lead	0.13	ug/L	U
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.038	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364116
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	86.0	%Rec	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8MOD				
Analytes	7440702	Calcium			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7429905	Aluminum	103	%Rec	
	7440393	Barium	102	%Rec	
	7440417	Beryllium	105	%Rec	
	7440439	Cadmium	95	%Rec	
	7440473	Chromium	103	%Rec	
	7440484	Cobalt	100	%Rec	
	7440508	Copper	100	%Rec	
	7439896	Iron	103	%Rec	
	7439965	Manganese	101	%Rec	
	7440020	Nickel	104	%Rec	
	7440622	Vanadium	107	%Rec	
	7440666	Zinc	102	%Rec	
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	101	%Rec	
	7440382	Arsenic	103	%Rec	
	7439921	Lead	95	%Rec	
	7782492	Selenium	100	%Rec	
	7440224	Silver	97	%Rec	
	7440280	Thallium	95	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364116
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	83.3	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: 200.8 MOD				
Analytes	: 7440702	Calcium			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7429905	Aluminum	100	%Rec	
	7440393	Barium	99	%Rec	
	7440417	Beryllium	102	%Rec	
	7440439	Cadmium	93	%Rec	
	7440473	Chromium	101	%Rec	
	7440484	Cobalt	97	%Rec	
	7440508	Copper	97	%Rec	
	7439896	Iron	101	%Rec	
	7439965	Manganese	99	%Rec	
	7440020	Nickel	99	%Rec	
	7440622	Vanadium	104	%Rec	
	7440666	Zinc	100	%Rec	
Parameter	: Metals, ICP/MS				
Method	: 200.8 MOD				
Prep Method	: 200.8 MOD				
Analytes	: 7440360	Antimony	104	%Rec	
	7440382	Arsenic	105	%Rec	
	7439921	Lead	99	%Rec	
	7782492	Selenium	100	%Rec	
	7440224	Silver	101	%Rec	
	7440280	Thallium	99	%Rec	

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364117
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 03SW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8MOD				
Analytes	**7429905**	**Aluminum**	**35**	**ug/L**	
	7440393	**Barium**	**31.1**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**44400**	**ug/L**	
	7440473	Chromium	6.3	ug/L	U
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**82.4**	**ug/L**	
	7439954	**Magnesium**	**10300**	**ug/L**	
	7439965	**Manganese**	**12.2**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**4840**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**1.7**	**ug/L**	
	7439921	Lead	0.13	ug/L	U
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364118
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC04 SW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**304**	**ug/L**	
	7440393	**Barium**	**28.4**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**36600**	**ug/L**	
	7440473	Chromium	6.3	ug/L	U
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**570**	**ug/L**	
	7439954	**Magnesium**	**8450**	**ug/L**	
	7439965	**Manganese**	**33.5**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**5050**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**2.6**	**ug/L**	
	7439921	**Lead**	**0.13**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364119
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC05 SW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**66**	**ug/L**	
	7440393	**Barium**	**11.3**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**12400**	**ug/L**	
	7440473	Chromium	6.3	ug/L	U
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**259**	**ug/L**	
	7439954	**Magnesium**	**3120**	**ug/L**	
	7439965	**Manganese**	**21.1**	**ug/L**	
	7440020	Nickel	13	ug/L	U
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**5210**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**2.5**	**ug/L**	
	7439921	Lead	0.13	ug/L	U
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364121
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MA01SW		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**294**	**ug/L**	
	7440393	**Barium**	**25.0**	**ug/L**	
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**31400**	**ug/L**	
	7440473	**Chromium**	**18**	**ug/L**	
	7440484	**Cobalt**	**11**	**ug/L**	
	7440508	**Copper**	**13.5**	**ug/L**	
	7439896	**Iron**	**95.8**	**ug/L**	
	7439954	**Magnesium**	**14800**	**ug/L**	
	7439965	**Manganese**	**508**	**ug/L**	
	7440020	**Nickel**	**34**	**ug/L**	
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**2150**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	**Zinc**	**22**	**ug/L**	
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	**7440360**	**Antimony**	**1.6**	**ug/L**	
	7440382	**Arsenic**	**1.3**	**ug/L**	
	7439921	**Lead**	**0.23**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364122
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB GC 01 SD		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**2.65**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: **7439976**	**Mercury**	**0.978**	**mg/kg**	**N**
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**15500**	**mg/kg**	
	7440382	**Arsenic**	**26.8**	**mg/kg**	
	7440393	**Barium**	**80.9**	**mg/kg**	
	7440417	**Beryllium**	**0.811**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**5220**	**mg/kg**	
	7440473	**Chromium**	**42.9**	**mg/kg**	
	7440484	**Cobalt**	**17.4**	**mg/kg**	
	7440508	**Copper**	**62.9**	**mg/kg**	
	7439896	**Iron**	**46000**	**mg/kg**	
	7439954	**Magnesium**	**4820**	**mg/kg**	
	7439965	**Manganese**	**844**	**mg/kg**	
	7440020	**Nickel**	**21.1**	**mg/kg**	
	7440097	**Potassium**	**307**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**267**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	150	mg/kg	
	7440666	Zinc	95.6	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364123
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 01 SD		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**3.58**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**3.85**	**mg/kg**	N
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**19100**	**mg/kg**	
	7440382	**Arsenic**	**66.6**	**mg/kg**	
	7440393	**Barium**	**86.1**	**mg/kg**	
	7440417	**Beryllium**	**0.905**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3680**	**mg/kg**	
	7440473	**Chromium**	**45.4**	**mg/kg**	
	7440484	**Cobalt**	**24.2**	**mg/kg**	
	7440508	**Copper**	**68.9**	**mg/kg**	
	7439896	**Iron**	**55800**	**mg/kg**	
	7439954	**Magnesium**	**2980**	**mg/kg**	
	7439965	**Manganese**	**2260**	**mg/kg**	
	7440020	**Nickel**	**30.7**	**mg/kg**	
	7440097	**Potassium**	**401**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**262**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	111	mg/kg	
	7440666	Zinc	76.8	mg/kg	

98364123 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 1/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364124
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB GC 02 SD		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**2.76**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**0.932**	**mg/kg**	**N**
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**21500**	**mg/kg**	
	7440382	**Arsenic**	**33.9**	**mg/kg**	
	7440393	**Barium**	**94.8**	**mg/kg**	
	7440417	**Beryllium**	**0.882**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**5980**	**mg/kg**	
	7440473	**Chromium**	**38.1**	**mg/kg**	
	7440484	**Cobalt**	**17.6**	**mg/kg**	
	7440508	**Copper**	**73.8**	**mg/kg**	
	7439896	**Iron**	**51900**	**mg/kg**	
	7439954	**Magnesium**	**5700**	**mg/kg**	
	7439965	**Manganese**	**877**	**mg/kg**	
	7440020	**Nickel**	**19.4**	**mg/kg**	
	7440097	**Potassium**	**437**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**362**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	145	mg/kg	
	7440666	Zinc	88.0	mg/kg	

98364124 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC02 SD - MS		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**4.57**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**5.61**	**mg/kg**	**N**
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**16600**	**mg/kg**	
	7440382	**Arsenic**	**55.5**	**mg/kg**	
	7440393	**Barium**	**98.4**	**mg/kg**	
	7440417	**Beryllium**	**0.792**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3750**	**mg/kg**	
	7440473	**Chromium**	**35.6**	**mg/kg**	
	7440484	**Cobalt**	**27.8**	**mg/kg**	
	7440508	**Copper**	**64.9**	**mg/kg**	
	7439896	**Iron**	**43300**	**mg/kg**	
	7439954	**Magnesium**	**2830**	**mg/kg**	
	7439965	**Manganese**	**1230**	**mg/kg**	
	7440020	**Nickel**	**23.7**	**mg/kg**	
	7440097	**Potassium**	**322**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**143**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	97.5	mg/kg	
	7440666	Zinc	66.3	mg/kg	

98364125 Reg sample

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**4.24**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**5.05**	**mg/kg**	N
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**16300**	**mg/kg**	
	7440382	**Arsenic**	**53.5**	**mg/kg**	
	7440393	**Barium**	**94.2**	**mg/kg**	
	7440417	**Beryllium**	**0.773**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3410**	**mg/kg**	
	7440473	**Chromium**	**32.7**	**mg/kg**	
	7440484	**Cobalt**	**27.5**	**mg/kg**	
	7440508	**Copper**	**66.7**	**mg/kg**	
	7439896	**Iron**	**42200**	**mg/kg**	
	7439954	**Magnesium**	**2490**	**mg/kg**	
	7439965	**Manganese**	**1220**	**mg/kg**	
	7440020	**Nickel**	**24.2**	**mg/kg**	
	7440097	**Potassium**	**259**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**120**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	90.4	mg/kg	
	7440666	Zinc	66.4	mg/kg	

98364125 Duplicate

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	77	%Rec	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	72	%Rec	
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	59	%Rec	
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	177	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum			NA
	7440702	Calcium			NA
	7439896	Iron			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7440360	Antimony	19	%Rec	
	7440382	Arsenic	98	%Rec	
	7440393	Barium	94	%Rec	
	7440417	Beryllium	102	%Rec	
	7440439	Cadmium	95	%Rec	
	7440473	Chromium	103	%Rec	
	7440484	Cobalt	96	%Rec	
	7440508	Copper	103	%Rec	
	7439965	Manganese	117	%Rec	
	7440020	Nickel	98	%Rec	
	7440224	Silver	92	%Rec	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	105	%Rec	
	7440666	Zinc	99	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364125
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	81	%Rec	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	72	%Rec	
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	58	%Rec	
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	156	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum			NA
	7440702	Calcium			NA
	7439896	Iron			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7440360	Antimony	12	%Rec	
	7440382	Arsenic	95	%Rec	
	7440393	Barium	95	%Rec	
	7440417	Beryllium	103	%Rec	
	7440439	Cadmium	96	%Rec	
	7440473	Chromium	104	%Rec	
	7440484	Cobalt	95	%Rec	
	7440508	Copper	100	%Rec	
	7439965	Manganese	88	%Rec	
	7440020	Nickel	99	%Rec	
	7440224	Silver	91	%Rec	

98364125 Matrix Spike Du

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	108	%Rec	
	7440666	Zinc	103	%Rec	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364126
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 03 SD		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**3.14**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**48.0**	**mg/kg**	N
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**15100**	**mg/kg**	
	7440382	**Arsenic**	**63.9**	**mg/kg**	
	7440393	**Barium**	**104**	**mg/kg**	
	7440417	**Beryllium**	**0.948**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3990**	**mg/kg**	
	7440473	**Chromium**	**47.2**	**mg/kg**	
	7440484	**Cobalt**	**25.0**	**mg/kg**	
	7440508	**Copper**	**65.1**	**mg/kg**	
	7439896	**Iron**	**61100**	**mg/kg**	
	7439954	**Magnesium**	**2620**	**mg/kg**	
	7439965	**Manganese**	**1260**	**mg/kg**	
	7440020	**Nickel**	**27.1**	**mg/kg**	
	7440097	**Potassium**	**339**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**188**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	135	mg/kg	
	7440666	Zinc	83.6	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364127
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 04 SD		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**3.17**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: **7439976**	**Mercury**	**1.22**	**mg/kg**	**N**
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**17300**	**mg/kg**	
	7440382	**Arsenic**	**66.7**	**mg/kg**	
	7440393	**Barium**	**115**	**mg/kg**	
	7440417	**Beryllium**	**0.802**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**4630**	**mg/kg**	
	7440473	**Chromium**	**38.7**	**mg/kg**	
	7440484	**Cobalt**	**21.5**	**mg/kg**	
	7440508	**Copper**	**66.2**	**mg/kg**	
	7439896	**Iron**	**42900**	**mg/kg**	
	7439954	**Magnesium**	**3700**	**mg/kg**	
	7439965	**Manganese**	**1190**	**mg/kg**	
	7440020	**Nickel**	**21.2**	**mg/kg**	
	7440097	**Potassium**	**313**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**180**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	98.9	mg/kg	
	7440666	Zinc	69.6	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364128
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB DC 05 SD		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**3.27**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**1.41**	**mg/kg**	N
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**20200**	**mg/kg**	
	7440382	**Arsenic**	**79.5**	**mg/kg**	
	7440393	**Barium**	**113**	**mg/kg**	
	7440417	**Beryllium**	**0.850**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**4600**	**mg/kg**	
	7440473	**Chromium**	**45.4**	**mg/kg**	
	7440484	**Cobalt**	**20.6**	**mg/kg**	
	7440508	**Copper**	**71.7**	**mg/kg**	
	7439896	**Iron**	**47900**	**mg/kg**	
	7439954	**Magnesium**	**3820**	**mg/kg**	
	7439965	**Manganese**	**1160**	**mg/kg**	
	7440020	**Nickel**	**23.5**	**mg/kg**	
	7440097	**Potassium**	**410**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**211**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	114	mg/kg	
	7440666	Zinc	72.6	mg/kg	

98364128 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364129
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MA01SD		

MET

			Result	Units	Qlfr
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**21.0**	**mg/kg**	**N**
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**84000**	**mg/kg**	
	7440382	**Arsenic**	**50.8**	**mg/kg**	
	7440393	**Barium**	**114**	**mg/kg**	
	7440417	**Beryllium**	**10.8**	**mg/kg**	
	7440439	Cadmium	0.86	mg/kg	UJ
	7440702	**Calcium**	**2210**	**mg/kg**	
	7440473	**Chromium**	**88.8**	**mg/kg**	
	7440484	**Cobalt**	**325**	**mg/kg**	
	7440508	**Copper**	**967**	**mg/kg**	
	7439896	**Iron**	**41900**	**mg/kg**	
	7439921	**Lead**	**25.9**	**mg/kg**	
	7439954	**Magnesium**	**593**	**mg/kg**	
	7439965	**Manganese**	**8320**	**mg/kg**	
	7440020	**Nickel**	**168**	**mg/kg**	
	7440097	**Potassium**	**380**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**39.6**	**mg/kg**	
	7440622	**Vanadium**	**119**	**mg/kg**	
	7440666	**Zinc**	**297**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364130
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT01SS		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**4.98**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**0.383**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**8000**	**mg/kg**	
	7440382	**Arsenic**	**52.0**	**mg/kg**	
	7440393	**Barium**	**39.7**	**mg/kg**	
	7440417	**Beryllium**	**1.14**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**668**	**mg/kg**	
	7440473	**Chromium**	**22.4**	**mg/kg**	
	7440484	**Cobalt**	**20.6**	**mg/kg**	
	7440508	**Copper**	**48.3**	**mg/kg**	
	7439896	**Iron**	**76100**	**mg/kg**	
	7439954	**Magnesium**	**198**	**mg/kg**	
	7439965	**Manganese**	**329**	**mg/kg**	
	7440020	**Nickel**	**11.8**	**mg/kg**	
	7440097	**Potassium**	**130**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**20.2**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	219	mg/kg	
	7440666	Zinc	112	mg/kg	

98364130 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364131
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT02SS		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**9.47**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: **7439976**	**Mercury**	**11.8**	**mg/kg**	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**17000**	**mg/kg**	
	7440382	**Arsenic**	**52.9**	**mg/kg**	
	7440393	**Barium**	**43.4**	**mg/kg**	
	7440417	**Beryllium**	**0.896**	**mg/kg**	
	7440439	Cadmium	0.28	mg/kg	UJ
	7440702	**Calcium**	**1650**	**mg/kg**	
	7440473	**Chromium**	**28.5**	**mg/kg**	
	7440484	**Cobalt**	**17.2**	**mg/kg**	
	7440508	**Copper**	**47.9**	**mg/kg**	
	7439896	**Iron**	**41400**	**mg/kg**	
	7439954	**Magnesium**	**429**	**mg/kg**	
	7439965	**Manganese**	**446**	**mg/kg**	
	7440020	**Nickel**	**13.2**	**mg/kg**	
	7440097	**Potassium**	**205**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**52.9**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	115	mg/kg	
	7440666	Zinc	95.2	mg/kg	

98364131 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364132
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT03SS		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**7.24**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: **7439976**	**Mercury**	**2.62**	**mg/kg**	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**70000**	**mg/kg**	
	7440360	Antimony	6.5	mg/kg	UJ
	7440382	**Arsenic**	**269**	**mg/kg**	
	7440393	**Barium**	**10.2**	**mg/kg**	
	7440417	**Beryllium**	**1.13**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**427**	**mg/kg**	
	7440473	**Chromium**	**95.6**	**mg/kg**	
	7440484	**Cobalt**	**16.3**	**mg/kg**	
	7440508	**Copper**	**97.9**	**mg/kg**	
	7439896	**Iron**	**57600**	**mg/kg**	
	7439954	**Magnesium**	**415**	**mg/kg**	
	7439965	**Manganese**	**630**	**mg/kg**	
	7440020	**Nickel**	**35.3**	**mg/kg**	
	7440097	**Potassium**	**75**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**143**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	115	mg/kg	
	7440666	Zinc	53.9	mg/kg	

98364132 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364133
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT04SS		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**7.96**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**3.44**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**61700**	**mg/kg**	
	7440360	Antimony	13	mg/kg	UJ
	7440382	**Arsenic**	**348**	**mg/kg**	
	7440393	**Barium**	**14.6**	**mg/kg**	
	7440417	**Beryllium**	**1.08**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**278**	**mg/kg**	
	7440473	**Chromium**	**79.2**	**mg/kg**	
	7440484	**Cobalt**	**12.4**	**mg/kg**	
	7440508	**Copper**	**96.4**	**mg/kg**	
	7439896	**Iron**	**59700**	**mg/kg**	
	7439954	**Magnesium**	**214**	**mg/kg**	
	7439965	**Manganese**	**265**	**mg/kg**	
	7440020	**Nickel**	**35.4**	**mg/kg**	
	7440097	**Potassium**	**81**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**119**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	117	mg/kg	
	7440666	Zinc	35.5	mg/kg	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364134
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT05SS		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**5.13**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**5.99**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**28700**	**mg/kg**	
	7440382	**Arsenic**	**109**	**mg/kg**	
	7440393	**Barium**	**21.7**	**mg/kg**	
	7440417	**Beryllium**	**0.744**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**2060**	**mg/kg**	
	7440473	**Chromium**	**49.1**	**mg/kg**	
	7440484	**Cobalt**	**24.0**	**mg/kg**	
	7440508	**Copper**	**69.9**	**mg/kg**	
	7439896	**Iron**	**41100**	**mg/kg**	
	7439954	**Magnesium**	**914**	**mg/kg**	
	7439965	**Manganese**	**800**	**mg/kg**	
	7440020	**Nickel**	**20.1**	**mg/kg**	
	7440097	**Potassium**	**205**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**92.9**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	93.3	mg/kg	
	7440666	Zinc	52.2	mg/kg	

98364134 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364135
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT06SS		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**9.59**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: **7439976**	**Mercury**	**1.12**	**mg/kg**	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**70700**	**mg/kg**	
	7440382	**Arsenic**	**382**	**mg/kg**	
	7440393	**Barium**	**23.9**	**mg/kg**	
	7440417	**Beryllium**	**0.919**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**378**	**mg/kg**	
	7440473	**Chromium**	**86.5**	**mg/kg**	
	7440484	**Cobalt**	**8.77**	**mg/kg**	
	7440508	**Copper**	**109**	**mg/kg**	
	7439896	**Iron**	**45400**	**mg/kg**	
	7439954	**Magnesium**	**257**	**mg/kg**	
	7439965	**Manganese**	**307**	**mg/kg**	
	7440020	**Nickel**	**24.2**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**158**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	120	mg/kg	
	7440666	Zinc	36.4	mg/kg	

98364135 Reg sample

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364135
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**1.22**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364135
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	92.3	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364135
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	101	%Rec	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364136
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT01SB		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**4.11**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**0.11**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**6840**	**mg/kg**	
	7440382	**Arsenic**	**56.7**	**mg/kg**	
	7440393	**Barium**	**16.9**	**mg/kg**	
	7440417	**Beryllium**	**1.07**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**639**	**mg/kg**	
	7440473	**Chromium**	**12.0**	**mg/kg**	
	7440484	**Cobalt**	**17.7**	**mg/kg**	
	7440508	**Copper**	**49.7**	**mg/kg**	
	7439896	**Iron**	**60100**	**mg/kg**	
	7439954	**Magnesium**	**156**	**mg/kg**	
	7439965	**Manganese**	**227**	**mg/kg**	
	7440020	**Nickel**	**9.21**	**mg/kg**	
	7440097	**Potassium**	**110**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**19.4**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	173	mg/kg	
	7440666	Zinc	99.5	mg/kg	

98364136 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364137
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT02SB		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**11.3**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**148**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**15800**	**mg/kg**	
	7440360	Antimony	9.0	mg/kg	UJ
	7440382	**Arsenic**	**239**	**mg/kg**	
	7440393	**Barium**	**9.26**	**mg/kg**	
	7440417	**Beryllium**	**0.997**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**249**	**mg/kg**	
	7440473	**Chromium**	**52.6**	**mg/kg**	
	7440484	**Cobalt**	**13.6**	**mg/kg**	
	7440508	**Copper**	**51.5**	**mg/kg**	
	7439896	**Iron**	**72800**	**mg/kg**	
	7439954	**Magnesium**	**150**	**mg/kg**	
	7439965	**Manganese**	**395**	**mg/kg**	
	7440020	**Nickel**	**26.3**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ
	7440235	Sodium	18.5	mg/kg	U

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	109	mg/kg	
	7440666	Zinc	44.7	mg/kg	

98364137 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364138
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT03SB		

MET

			Result	Units	Qlfr
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**5.44**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**74800**	**mg/kg**	
	7440382	**Arsenic**	**356**	**mg/kg**	
	7440393	**Barium**	**10.9**	**mg/kg**	
	7440417	**Beryllium**	**1.10**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**636**	**mg/kg**	
	7440473	**Chromium**	**114**	**mg/kg**	
	7440484	**Cobalt**	**20.6**	**mg/kg**	
	7440508	**Copper**	**120**	**mg/kg**	
	7439896	**Iron**	**67400**	**mg/kg**	
	7439921	**Lead**	**11.0**	**mg/kg**	J
	7439954	**Magnesium**	**470**	**mg/kg**	
	7439965	**Manganese**	**635**	**mg/kg**	
	7440020	**Nickel**	**45.4**	**mg/kg**	
	7440097	**Potassium**	**100**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**171**	**mg/kg**	
	7440622	**Vanadium**	**130**	**mg/kg**	
	7440666	**Zinc**	**70.3**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364139
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT04SB		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**7.44**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**3.66**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440360	Antimony			R
	7429905	**Aluminum**	**64400**	**mg/kg**	
	7440382	**Arsenic**	**338**	**mg/kg**	
	7440393	**Barium**	**17.3**	**mg/kg**	
	7440417	**Beryllium**	**1.11**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**269**	**mg/kg**	
	7440473	**Chromium**	**79.5**	**mg/kg**	
	7440484	**Cobalt**	**10.7**	**mg/kg**	
	7440508	**Copper**	**93.8**	**mg/kg**	
	7439896	**Iron**	**54000**	**mg/kg**	
	7439954	**Magnesium**	**173**	**mg/kg**	
	7439965	**Manganese**	**218**	**mg/kg**	
	7440020	**Nickel**	**29.1**	**mg/kg**	
	7440097	**Potassium**	**84**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**122**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	113	mg/kg	
	7440666	Zinc	33.3	mg/kg	

98364139 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364140
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT05SB		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**7.30**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	0.40	mg/kg	UJ
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: **7439976**	**Mercury**	**2.04**	**mg/kg**	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440360	Antimony			R
	7429905	**Aluminum**	**81400**	**mg/kg**	
	7440382	**Arsenic**	**143**	**mg/kg**	
	7440393	**Barium**	**10.2**	**mg/kg**	
	7440417	**Beryllium**	**1.17**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**948**	**mg/kg**	
	7440473	**Chromium**	**135**	**mg/kg**	
	7440484	**Cobalt**	**34.4**	**mg/kg**	
	7440508	**Copper**	**118**	**mg/kg**	
	7439896	**Iron**	**71500**	**mg/kg**	
	7439954	**Magnesium**	**967**	**mg/kg**	
	7439965	**Manganese**	**1920**	**mg/kg**	
	7440020	**Nickel**	**47.5**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**208**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	127	mg/kg	
	7440666	Zinc	99.1	mg/kg	

98364140 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364141
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MT06SB		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**12.1**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.40	mg/kg	UJ
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**1.18**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**78000**	**mg/kg**	
	7440360	Antimony	11	mg/kg	UJ
	7440382	**Arsenic**	**330**	**mg/kg**	
	7440393	**Barium**	**68.0**	**mg/kg**	
	7440417	**Beryllium**	**1.02**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**157**	**mg/kg**	
	7440473	**Chromium**	**84.7**	**mg/kg**	
	7440484	**Cobalt**	**5.80**	**mg/kg**	
	7440508	**Copper**	**109**	**mg/kg**	
	7439896	**Iron**	**42800**	**mg/kg**	
	7439954	**Magnesium**	**121**	**mg/kg**	
	7439965	**Manganese**	**183**	**mg/kg**	
	7440020	**Nickel**	**20.9**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**163**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	128	mg/kg	
	7440666	Zinc	35.0	mg/kg	

98364141 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364142
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK01 SS		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**17.6**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7782492**	**Selenium**	**1.4**	**mg/kg**	**J**
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**2550**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**18400**	**mg/kg**	
	7440360	Antimony	16	mg/kg	UJ
	7440382	**Arsenic**	**270**	**mg/kg**	
	7440393	**Barium**	**21.1**	**mg/kg**	
	7440417	**Beryllium**	**0.42**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**4250**	**mg/kg**	
	7440473	**Chromium**	**51.8**	**mg/kg**	
	7440484	**Cobalt**	**15.5**	**mg/kg**	
	7440508	**Copper**	**122**	**mg/kg**	
	7439896	**Iron**	**51000**	**mg/kg**	
	7439954	**Magnesium**	**2370**	**mg/kg**	
	7439965	**Manganese**	**635**	**mg/kg**	
	7440020	**Nickel**	**36.7**	**mg/kg**	
	7440097	**Potassium**	**74**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**109**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	85.3	mg/kg	
	7440666	Zinc	926	mg/kg	

98364142 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364143
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK02 SS		

			Result	Units	Qlfr
MET					
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**17.2**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: **7439976**	**Mercury**	**1800**	**mg/kg**	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**3420**	**mg/kg**	
	7440360	Antimony	25.6	mg/kg	UJ
	7440382	**Arsenic**	**145**	**mg/kg**	
	7440393	**Barium**	**10.3**	**mg/kg**	
	7440417	**Beryllium**	**0.594**	**mg/kg**	
	7440439	**Cadmium**	**0.37**	**mg/kg**	
	7440702	**Calcium**	**2390**	**mg/kg**	
	7440473	**Chromium**	**44.3**	**mg/kg**	
	7440484	**Cobalt**	**24.5**	**mg/kg**	
	7440508	**Copper**	**137**	**mg/kg**	
	7439896	**Iron**	**54400**	**mg/kg**	
	7439954	**Magnesium**	**1200**	**mg/kg**	
	7439965	**Manganese**	**1190**	**mg/kg**	
	7440020	**Nickel**	**34.5**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**25.9**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	92.7	mg/kg	
	7440666	Zinc	1170	mg/kg	

98364143 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364144
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK03 SS		

MET

			Result	Units	Qlfr
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**2390**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**9420**	**mg/kg**	
	7440360	Antimony	37.1	mg/kg	UJ
	7440382	**Arsenic**	**153**	**mg/kg**	
	7440393	**Barium**	**22.4**	**mg/kg**	
	7440417	**Beryllium**	**0.568**	**mg/kg**	
	7440439	**Cadmium**	**1.92**	**mg/kg**	
	7440702	**Calcium**	**1940**	**mg/kg**	
	7440473	**Chromium**	**54.0**	**mg/kg**	
	7440484	**Cobalt**	**23.1**	**mg/kg**	
	7440508	**Copper**	**170**	**mg/kg**	
	7439896	**Iron**	**71300**	**mg/kg**	
	7439921	**Lead**	**57.4**	**mg/kg**	
	7439954	**Magnesium**	**1050**	**mg/kg**	
	7439965	**Manganese**	**1180**	**mg/kg**	
	7440020	**Nickel**	**39.5**	**mg/kg**	
	7440097	Potassium	70	mg/kg	U
	7440224	**Silver**	**0.40**	**mg/kg**	**J**
	7440235	**Sodium**	**46.7**	**mg/kg**	
	7440622	**Vanadium**	**91.8**	**mg/kg**	
	7440666	**Zinc**	**2330**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364145
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK04 SS		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**18.6**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7782492**	**Selenium**	**0.67**	**mg/kg**	**J**
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**54300**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**2370**	**mg/kg**	
	7440360	Antimony	33.2	mg/kg	UJ
	7440382	**Arsenic**	**952**	**mg/kg**	
	7440393	**Barium**	**3.39**	**mg/kg**	
	7440417	**Beryllium**	**1.46**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**35.9**	**mg/kg**	
	7440473	**Chromium**	**858**	**mg/kg**	
	7440484	**Cobalt**	**42.7**	**mg/kg**	
	7440508	**Copper**	**535**	**mg/kg**	
	7439896	**Iron**	**372000**	**mg/kg**	
	7439954	**Magnesium**	**77.1**	**mg/kg**	
	7439965	**Manganese**	**426**	**mg/kg**	
	7440020	**Nickel**	**188**	**mg/kg**	
	7440097	**Potassium**	**73**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	Sodium	14.1	mg/kg	U

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	682	mg/kg	
	7440666	Zinc	29.6	mg/kg	

98364145 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364146
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK05 SS		

MET

			Result	Units	Qlfr
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.40	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: **7439976**	**Mercury**	**359**	**mg/kg**	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**34900**	**mg/kg**	
	7440360	Antimony	20.4	mg/kg	UJ
	7440382	**Arsenic**	**183**	**mg/kg**	
	7440393	**Barium**	**36.0**	**mg/kg**	
	7440417	**Beryllium**	**0.673**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3610**	**mg/kg**	
	7440473	**Chromium**	**62.3**	**mg/kg**	
	7440484	**Cobalt**	**18.4**	**mg/kg**	
	7440508	**Copper**	**138**	**mg/kg**	
	7439896	**Iron**	**47800**	**mg/kg**	
	7439921	**Lead**	**31.1**	**mg/kg**	
	7439954	**Magnesium**	**1460**	**mg/kg**	
	7439965	**Manganese**	**915**	**mg/kg**	
	7440020	**Nickel**	**31.0**	**mg/kg**	
	7440097	**Potassium**	**258**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**804**	**mg/kg**	
	7440622	**Vanadium**	**88.8**	**mg/kg**	
	7440666	**Zinc**	**454**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 2/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364147
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK06 SS		

MET

			Result	Units	Qlfr
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**174**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**36200**	**mg/kg**	
	7440360	Antimony	4.5	mg/kg	UJ
	7440382	**Arsenic**	**114**	**mg/kg**	
	7440393	**Barium**	**82.7**	**mg/kg**	
	7440417	**Beryllium**	**0.769**	**mg/kg**	
	7440439	**Cadmium**	**0.20**	**mg/kg**	
	7440702	**Calcium**	**2950**	**mg/kg**	
	7440473	**Chromium**	**49.3**	**mg/kg**	
	7440484	**Cobalt**	**12.5**	**mg/kg**	
	7440508	**Copper**	**113**	**mg/kg**	
	7439896	**Iron**	**42800**	**mg/kg**	
	7439921	**Lead**	**57.5**	**mg/kg**	
	7439954	**Magnesium**	**2210**	**mg/kg**	
	7439965	**Manganese**	**483**	**mg/kg**	
	7440020	**Nickel**	**23.0**	**mg/kg**	
	7440097	**Potassium**	**548**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**542**	**mg/kg**	
	7440622	**Vanadium**	**95.9**	**mg/kg**	
	7440666	**Zinc**	**276**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364148
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK01SB		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**9.71**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**397**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**29300**	**mg/kg**	
	7440360	Antimony	17	mg/kg	UJ
	7440382	**Arsenic**	**173**	**mg/kg**	
	7440393	**Barium**	**53.4**	**mg/kg**	
	7440417	**Beryllium**	**0.588**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**4920**	**mg/kg**	
	7440473	**Chromium**	**45.5**	**mg/kg**	
	7440484	**Cobalt**	**10.8**	**mg/kg**	
	7440508	**Copper**	**67.5**	**mg/kg**	
	7439896	**Iron**	**35900**	**mg/kg**	
	7439954	**Magnesium**	**2160**	**mg/kg**	
	7439965	**Manganese**	**481**	**mg/kg**	
	7440020	**Nickel**	**26.4**	**mg/kg**	
	7440097	**Potassium**	**370**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**109**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	101	mg/kg	
	7440666	Zinc	85.3	mg/kg	

98364148 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364149
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK02SB		

MET

			Result	Units	Qlfr
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	7439976	**Mercury**	**237**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7429905	**Aluminum**	**27000**	**mg/kg**	
	7440360	Antimony	7.6	mg/kg	UJ
	7440382	**Arsenic**	**102**	**mg/kg**	
	7440393	**Barium**	**125**	**mg/kg**	
	7440417	**Beryllium**	**0.49**	**mg/kg**	
	7440439	**Cadmium**	**0.21**	**mg/kg**	
	7440702	**Calcium**	**3600**	**mg/kg**	
	7440473	**Chromium**	**44.5**	**mg/kg**	
	7440484	**Cobalt**	**9.36**	**mg/kg**	
	7440508	**Copper**	**75.6**	**mg/kg**	
	7439896	**Iron**	**72000**	**mg/kg**	
	7439921	**Lead**	**34.4**	**mg/kg**	
	7439954	**Magnesium**	**1580**	**mg/kg**	
	7439965	**Manganese**	**313**	**mg/kg**	
	7440020	**Nickel**	**25.7**	**mg/kg**	
	7440097	**Potassium**	**1080**	**mg/kg**	
	7440224	**Silver**	**0.54**	**mg/kg**	**J**
	7440235	**Sodium**	**815**	**mg/kg**	
	7440622	**Vanadium**	**69.4**	**mg/kg**	
	7440666	**Zinc**	**244**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364150
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK03SB		

MET

			Result	Units	Qlfr
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: **7439921**	**Lead**	**8.60**	**mg/kg**	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	0.30	mg/kg	UJ
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium			R
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: **7439976**	**Mercury**	**91.9**	**mg/kg**	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: **7429905**	**Aluminum**	**46800**	**mg/kg**	
	7440360	Antimony	14	mg/kg	UJ
	7440382	**Arsenic**	**132**	**mg/kg**	
	7440393	**Barium**	**20.9**	**mg/kg**	
	7440417	**Beryllium**	**0.782**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**5430**	**mg/kg**	
	7440473	**Chromium**	**77.0**	**mg/kg**	
	7440484	**Cobalt**	**24.9**	**mg/kg**	
	7440508	**Copper**	**126**	**mg/kg**	
	7439896	**Iron**	**53900**	**mg/kg**	
	7439954	**Magnesium**	**3340**	**mg/kg**	
	7439965	**Manganese**	**1280**	**mg/kg**	
	7440020	**Nickel**	**41.0**	**mg/kg**	
	7440097	**Potassium**	**160**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**318**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	121	mg/kg	
	7440666	Zinc	139	mg/kg	

98364150 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB MK04SB - MS		

MET

			Result	Units	Qlfr
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**264**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**41300**	**mg/kg**	
	7440360	Antimony	15	mg/kg	UJ
	7440382	**Arsenic**	**135**	**mg/kg**	
	7440393	**Barium**	**62.0**	**mg/kg**	
	7440417	**Beryllium**	**0.842**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**2540**	**mg/kg**	
	7440473	**Chromium**	**57.9**	**mg/kg**	
	7440484	**Cobalt**	**18.1**	**mg/kg**	
	7440508	**Copper**	**153**	**mg/kg**	
	7439896	**Iron**	**54900**	**mg/kg**	
	7439921	**Lead**	**51.7**	**mg/kg**	
	7439954	**Magnesium**	**1990**	**mg/kg**	
	7439965	**Manganese**	**675**	**mg/kg**	
	7440020	**Nickel**	**32.7**	**mg/kg**	
	7440097	**Potassium**	**337**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**166**	**mg/kg**	
	7440622	**Vanadium**	**114**	**mg/kg**	
	7440666	**Zinc**	**307**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Duplicate
Station Description:			

MET

			Result	Units	Qlfr
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**277**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**38900**	**mg/kg**	
	7440360	Antimony	6.8	mg/kg	UJ
	7440382	**Arsenic**	**140**	**mg/kg**	
	7440393	**Barium**	**74.2**	**mg/kg**	
	7440417	**Beryllium**	**0.794**	**mg/kg**	
	7440439	**Cadmium**	**0.33**	**mg/kg**	
	7440702	**Calcium**	**2420**	**mg/kg**	
	7440473	**Chromium**	**51.8**	**mg/kg**	
	7440484	**Cobalt**	**16.9**	**mg/kg**	
	7440508	**Copper**	**132**	**mg/kg**	
	7439896	**Iron**	**48000**	**mg/kg**	
	7439921	**Lead**	**52.8**	**mg/kg**	
	7439954	**Magnesium**	**1780**	**mg/kg**	
	7439965	**Manganese**	**628**	**mg/kg**	
	7440020	**Nickel**	**28.4**	**mg/kg**	
	7440097	**Potassium**	**265**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**166**	**mg/kg**	
	7440622	**Vanadium**	**99.6**	**mg/kg**	
	7440666	**Zinc**	**277**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	49	%Rec	
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	3	%Rec	
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury			NA
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7429905	Aluminum			NA
	7440702	Calcium			NA
	7439896	Iron			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7440360	Antimony	35	%Rec	
	7440382	Arsenic	92	%Rec	
	7440393	Barium	93	%Rec	
	7440417	Beryllium	101	%Rec	
	7440439	Cadmium	96	%Rec	
	7440473	Chromium	95	%Rec	
	7440484	Cobalt	93	%Rec	
	7440508	Copper	109	%Rec	
	7439921	Lead	100	%Rec	
	7439965	Manganese	93	%Rec	
	7440020	Nickel	95	%Rec	
	7440224	Silver	96	%Rec	
	7440622	Vanadium	99	%Rec	
	7440666	Zinc	92	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364151
Account Code:	98T10PFAX10ZZLA00	**Type:**	Matrix Spike Dupl
Station Description:			

MET

			Result	Units	Qlfr
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	54	%Rec	
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	1	%Rec	
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	7439976	Mercury			NA
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7429905	Aluminum			NA
	7440702	Calcium			NA
	7439896	Iron			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7440360	Antimony	45	%Rec	
	7440382	Arsenic	89	%Rec	
	7440393	Barium	93	%Rec	
	7440417	Beryllium	101	%Rec	
	7440439	Cadmium	96	%Rec	
	7440473	Chromium	86	%Rec	
	7440484	Cobalt	92	%Rec	
	7440508	Copper	68	%Rec	
	7439921	Lead	94	%Rec	
	7439965	Manganese	58	%Rec	
	7440020	Nickel	94	%Rec	
	7440224	Silver	95	%Rec	
	7440622	Vanadium	93	%Rec	
	7440666	Zinc	71	%Rec	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364152
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB BG01SS		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**5.11**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.30	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**15.2**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**20600**	**mg/kg**	
	7440360	Antimony	7.7	mg/kg	UJ
	7440382	**Arsenic**	**68.5**	**mg/kg**	
	7440393	**Barium**	**103**	**mg/kg**	
	7440417	**Beryllium**	**0.972**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**1880**	**mg/kg**	
	7440473	**Chromium**	**48.4**	**mg/kg**	
	7440484	**Cobalt**	**21.6**	**mg/kg**	
	7440508	**Copper**	**84.2**	**mg/kg**	
	7439896	**Iron**	**50800**	**mg/kg**	
	7439954	**Magnesium**	**1510**	**mg/kg**	
	7439965	**Manganese**	**1530**	**mg/kg**	
	7440020	**Nickel**	**29.4**	**mg/kg**	
	7440097	**Potassium**	**305**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**75.3**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	133	mg/kg	
	7440666	Zinc	83.8	mg/kg	

98364152 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364153
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB BG02SS		

MET

			Result	Units	Qlfr
Parameter	Arsenic by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7440382**	**Arsenic**	**18.8**	**mg/kg**	**J**
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**9.74**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.30	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**5.48**	**mg/kg**	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**37900**	**mg/kg**	
	7440360	Antimony	4.5	mg/kg	UJ
	7440393	**Barium**	**281**	**mg/kg**	
	7440417	**Beryllium**	**1.29**	**mg/kg**	
	7440439	**Cadmium**	**0.23**	**mg/kg**	
	7440702	**Calcium**	**6440**	**mg/kg**	
	7440473	**Chromium**	**61.4**	**mg/kg**	
	7440484	**Cobalt**	**34.0**	**mg/kg**	
	7440508	**Copper**	**120**	**mg/kg**	
	7439896	**Iron**	**68600**	**mg/kg**	
	7439954	**Magnesium**	**1820**	**mg/kg**	
	7439965	**Manganese**	**3520**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: **7440020**	**Nickel**	**28.9**	**mg/kg**	
	7440097	**Potassium**	**1050**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**71.6**	**mg/kg**	
	7440622	**Vanadium**	**184**	**mg/kg**	
	7440666	**Zinc**	**105**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	98364154
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB BG01SB		

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	**7439921**	**Lead**	**4.93**	**mg/kg**	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.40	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium			R
Parameter	All MERCURY tests				
Method	245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	245.5	Determination of Mercury in Sediments by			
Analytes	**7439976**	**Mercury**	**11.1**	**mg/kg**	N
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	**7429905**	**Aluminum**	**18700**	**mg/kg**	
	7440360	Antimony	4.5	mg/kg	UJ
	7440382	**Arsenic**	**69.4**	**mg/kg**	
	7440393	**Barium**	**100**	**mg/kg**	
	7440417	**Beryllium**	**0.973**	**mg/kg**	
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**2080**	**mg/kg**	
	7440473	**Chromium**	**45.8**	**mg/kg**	
	7440484	**Cobalt**	**20.8**	**mg/kg**	
	7440508	**Copper**	**79.5**	**mg/kg**	
	7439896	**Iron**	**49000**	**mg/kg**	
	7439954	**Magnesium**	**1470**	**mg/kg**	
	7439965	**Manganese**	**1470**	**mg/kg**	
	7440020	**Nickel**	**27.6**	**mg/kg**	
	7440097	**Potassium**	**242**	**mg/kg**	
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**68.8**	**mg/kg**	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	130	mg/kg	
	7440666	Zinc	84.7	mg/kg	

98364154 Reg sample

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364155
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB RS01 WA		

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	0.20	ug/L	U
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: 200.8 MOD				
Analytes	: **7429905**	**Aluminum**	**110**	**ug/L**	
	7440393	Barium	1.3	ug/L	U
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**57.4**	**ug/L**	
	7440473	**Chromium**	**29.5**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**200**	**ug/L**	
	7439954	**Magnesium**	**62**	**ug/L**	
	7439965	**Manganese**	**6.46**	**ug/L**	
	7440020	**Nickel**	**14**	**ug/L**	
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**75**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	: Metals, ICP/MS				
Method	: 200.8 MOD				
Prep Method	: 200.8 MOD				
Analytes	: 7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**1.6**	**ug/L**	
	7439921	**Lead**	**0.25**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	9/ 3/98
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	98364156
Account Code:	98T10PFAX10ZZLA00	**Type:**	Reg sample
Station Description:	98 BB RS02 WA		

MET

			Result	Units	Qlfr
Parameter	All MERCURY tests				
Method	245.1	Cold vapor mercury in water			
Prep Method	245.1	Determination of Mercury in Water by Col			
Analytes	7439976	Mercury	0.20	ug/L	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	200.8 MOD				
Analytes	**7429905**	**Aluminum**	**72**	**ug/L**	
	7440393	Barium	1.3	ug/L	U
	7440417	Beryllium	1.3	ug/L	U
	7440439	Cadmium	2.5	ug/L	U
	7440702	**Calcium**	**42.9**	**ug/L**	
	7440473	**Chromium**	**18**	**ug/L**	
	7440484	Cobalt	6.3	ug/L	U
	7440508	Copper	3.8	ug/L	U
	7439896	**Iron**	**137**	**ug/L**	
	7439954	**Magnesium**	**33**	**ug/L**	
	7439965	**Manganese**	**5.4**	**ug/L**	
	7440020	**Nickel**	**15**	**ug/L**	
	7440097	Potassium	880	ug/L	U
	7440235	**Sodium**	**84**	**ug/L**	
	7440622	Vanadium	3.8	ug/L	U
	7440666	Zinc	5.0	ug/L	U
Parameter	Metals, ICP/MS				
Method	200.8 MOD				
Prep Method	200.8 MOD				
Analytes	7440360	Antimony	0.63	ug/L	U
	7440382	**Arsenic**	**1.0**	**ug/L**	
	7439921	**Lead**	**0.14**	**ug/L**	
	7782492	Selenium	1.3	ug/L	U
	7440224	Silver	0.037	ug/L	U
	7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980921A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	0.10	mg/kg	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980921A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	96.5	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980921B
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	0.10	mg/kg	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980921B
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	101	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980925A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7439921	Lead	0.10	mg/kg	U
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.20	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.20	mg/kg	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7429905	Aluminum	2.0	mg/kg	U
	7440360	Antimony	4.5	mg/kg	U
	7440382	Arsenic	4.0	mg/kg	U
	7440393	Barium	0.10	mg/kg	U
	7440417	Beryllium	0.10	mg/kg	U
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**3.37**	**mg/kg**	
	7440473	Chromium	0.50	mg/kg	U
	7440484	Cobalt	0.50	mg/kg	U
	7440508	Copper	0.30	mg/kg	U
	7439896	Iron	1.0	mg/kg	U
	7439954	Magnesium	2.0	mg/kg	U
	7439965	Manganese	0.10	mg/kg	U
	7440020	Nickel	1.0	mg/kg	U
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	U
	7440235	**Sodium**	**3.8**	**mg/kg**	
	7440622	Vanadium	0.30	mg/kg	U
	7440666	Zinc	0.40	mg/kg	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980925A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Spike Blank
Station Description:			

MET

			Result	Units	Qlfr
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7439921	Lead	91	%Rec	
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	92	%Rec	
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	88	%Rec	
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7440702	Calcium			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7429905	Aluminum	98	%Rec	
	7440360	Antimony	101	%Rec	
	7440382	Arsenic	95	%Rec	
	7440393	Barium	95	%Rec	
	7440417	Beryllium	100	%Rec	
	7440439	Cadmium	95	%Rec	
	7440473	Chromium	97	%Rec	
	7440484	Cobalt	96	%Rec	
	7440508	Copper	95	%Rec	
	7439896	Iron	98	%Rec	
	7439965	Manganese	96	%Rec	
	7440020	Nickel	98	%Rec	
	7440224	Silver	94	%Rec	
	7440622	Vanadium	99	%Rec	
	7440666	Zinc	97	%Rec	

XS980925A Spike Blank

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980928A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	**Mercury**	**1.75**	**mg/kg**	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980928A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury			NA

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980929A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

MET

			Result	Units	Qlfr
Parameter	Arsenic by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440382	Arsenic	0.10	mg/kg	U
Parameter	Lead by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7439921	Lead	0.1	mg/kg	U
Parameter	Selenium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7782492	Selenium	0.20	mg/kg	UJ
Parameter	Thallium by AA, RAS				
Method	200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	ILM04.0				
Analytes	7440280	Thallium	0.20	mg/kg	U
Parameter	Metals, ICP-SAS				
Method	200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	ILM04.0				
Analytes	7429905	Aluminum	2.0	mg/kg	U
	7440360	Antimony	4.5	mg/kg	U
	7440393	Barium	0.10	mg/kg	U
	7440417	Beryllium	0.10	mg/kg	U
	7440439	Cadmium	0.20	mg/kg	U
	7440702	**Calcium**	**2.39**	**mg/kg**	
	7440473	Chromium	0.50	mg/kg	U
	7440484	Cobalt	0.50	mg/kg	U
	7440508	Copper	0.30	mg/kg	U
	7439896	**Iron**	**1.6**	**mg/kg**	
	7439954	Magnesium	2.0	mg/kg	U
	7439965	Manganese	0.10	mg/kg	U
	7440020	Nickel	1.0	mg/kg	U
	7440097	Potassium	70	mg/kg	U
	7440224	Silver	0.40	mg/kg	UJ
	7440235	**Sodium**	**4.7**	**mg/kg**	
	7440622	Vanadium	0.30	mg/kg	U

			Result	Units	Qlfr
Analytes	: 7440666	Zinc	0.40	mg/kg	U

XS980929A Blank

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980929A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Spike Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: Arsenic by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440382	Arsenic	110	%Rec	
Parameter	: Lead by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7439921	Lead	89	%Rec	
Parameter	: Selenium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7782492	Selenium	95	%Rec	
Parameter	: Thallium by AA, RAS				
Method	: 200.9	Graphite Furnace Atomic Absorption Spectroscopy, EMSL-CIN			
Prep Method	: ILM04.0				
Analytes	: 7440280	Thallium	95	%Rec	
Parameter	: Metals, ICP-SAS				
Method	: 200.7-M	Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0			
Prep Method	: ILM04.0				
Analytes	: 7440702	Calcium			NA
	7439954	Magnesium			NA
	7440097	Potassium			NA
	7440235	Sodium			NA
	7429905	Aluminum	97	%Rec	
	7440360	Antimony	100	%Rec	
	7440382	Arsenic	95	%Rec	
	7440393	Barium	94	%Rec	
	7440417	Beryllium	99	%Rec	
	7440439	Cadmium	95	%Rec	
	7440473	Chromium	98	%Rec	
	7440484	Cobalt	96	%Rec	
	7440508	Copper	95	%Rec	
	7439896	Iron	98	%Rec	
	7439965	Manganese	96	%Rec	
	7440020	Nickel	99	%Rec	
	7440224	Silver	94	%Rec	

			Result	Units	Qlfr
Analytes	: 7440622	Vanadium	101	%Rec	
	7440666	Zinc	98	%Rec	

XS980929A Spike Blank

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980930A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	0.10	mg/kg	U

XS980930A Blank

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Solid
Project Officer:	MARK ADER	**Sample Number:**	MXS980930A
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.5	Mercury, Cold Vapor, Manual, Sediments			
Prep Method	: 245.5	Determination of Mercury in Sediments by			
Analytes	: 7439976	Mercury	97.2	%Rec	

XS980930A Control

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980916
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	0.20	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980916
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	105	%Rec	

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980917
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	0.20	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980917
Account Code:	98T10PFAX10ZZLA00	**Type:**	Control
Station Description:			

			Result	Units	Qlfr
MET					
Parameter	: All MERCURY tests				
Method	: 245.1	Cold vapor mercury in water			
Prep Method	: 245.1	Determination of Mercury in Water by Col			
Analytes	: 7439976	Mercury	92.2	%Rec	

XW980917A Control

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980924
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

MET

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8 MOD

Analytes		Result	Units	Qlfr
7429905	Aluminum	25	ug/L	U
7440393	Barium	1.3	ug/L	U
7440417	Beryllium	1.3	ug/L	U
7440439	Cadmium	2.5	ug/L	U
7440702	Calcium	6.3	ug/L	U
7440473	Chromium	6.3	ug/L	U
7440484	Cobalt	6.3	ug/L	U
7440508	Copper	3.8	ug/L	U
7439896	Iron	13	ug/L	U
7439954	Magnesium	25	ug/L	U
7439965	Manganese	1.3	ug/L	U
7440020	Nickel	13	ug/L	U
7440097	Potassium	880	ug/L	U
7440235	Sodium	25	ug/L	U
7440622	Vanadium	3.8	ug/L	U
7440666	Zinc	5.0	ug/L	U

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

Analytes				
7440360	Antimony	0.63	ug/L	U
7440382	Arsenic	0.63	ug/L	U
7439921	Lead	0.13	ug/L	U
7782492	Selenium	1.3	ug/L	U
7440224	Silver	0.037	ug/L	U
7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980924
Account Code:	98T10PFAX10ZZLA00	**Type:**	Spike Blank
Station Description:			

MET

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8 MOD

Analytes		Result	Units	Qlfr
7440702	Calcium			NA
7439954	Magnesium			NA
7440097	Potassium			NA
7440235	Sodium			NA
7429905	Aluminum	102	%Rec	
7440393	Barium	100	%Rec	
7440417	Beryllium	102	%Rec	
7440439	Cadmium	95	%Rec	
7440473	Chromium	102	%Rec	
7440484	Cobalt	101	%Rec	
7440508	Copper	100	%Rec	
7439896	Iron	103	%Rec	
7439965	Manganese	101	%Rec	
7440020	Nickel	105	%Rec	
7440622	Vanadium	106	%Rec	
7440666	Zinc	102	%Rec	

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

Analytes			
7440360	Antimony	102	%Rec
7440382	Arsenic	102	%Rec
7439921	Lead	100	%Rec
7782492	Selenium	103	%Rec
7440224	Silver	98	%Rec
7440280	Thallium	99	%Rec

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980924B
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

MET

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8MOD

Analytes		Result	Units	Qlfr
7429905	Aluminum	25	ug/L	U
7440393	Barium	1.3	ug/L	U
7440417	Beryllium	1.3	ug/L	U
7440439	Cadmium	2.5	ug/L	U
7440702	Calcium	6.3	ug/L	U
7440473	Chromium	6.3	ug/L	U
7440484	Cobalt	6.3	ug/L	U
7440508	Copper	3.8	ug/L	U
7439896	Iron	13	ug/L	U
7439954	Magnesium	25	ug/L	U
7439965	Manganese	1.3	ug/L	U
7440020	Nickel	13	ug/L	U
7440097	Potassium	880	ug/L	U
7440235	Sodium	25	ug/L	U
7440622	Vanadium	3.8	ug/L	U
7440666	Zinc	5.0	ug/L	U

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

Analytes				
7440360	Antimony	0.63	ug/L	U
7440382	Arsenic	0.63	ug/L	U
7439921	Lead	0.13	ug/L	U
7782492	Selenium	1.3	ug/L	U
7440224	Silver	0.037	ug/L	U
7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980924B
Account Code:	98T10PFAX10ZZLA00	**Type:**	Spike Blank
Station Description:			

MET

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8 MOD

Analytes		Result	Units	Qlfr
7440702	Calcium			NA
7439954	Magnesium			NA
7440097	Potassium			NA
7440235	Sodium			NA
7429905	Aluminum	102	%Rec	
7440393	Barium	100	%Rec	
7440417	Beryllium	103	%Rec	
7440439	Cadmium	96	%Rec	
7440473	Chromium	105	%Rec	
7440484	Cobalt	101	%Rec	
7440508	Copper	100	%Rec	
7439896	Iron	104	%Rec	
7439965	Manganese	102	%Rec	
7440020	Nickel	105	%Rec	
7440622	Vanadium	106	%Rec	
7440666	Zinc	102	%Rec	

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

Analytes			
7440360	Antimony	104	%Rec
7440382	Arsenic	104	%Rec
7439921	Lead	103	%Rec
7782492	Selenium	104	%Rec
7440224	Silver	102	%Rec
7440280	Thallium	100	%Rec

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980929
Account Code:	98T10PFAX10ZZLA00	**Type:**	Blank
Station Description:			

MET

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8 MOD

Analytes		Result	Units	Qlfr
7429905	Aluminum	25	ug/L	U
7440393	Barium	1.3	ug/L	U
7440417	Beryllium	1.3	ug/L	U
7440439	Cadmium	2.5	ug/L	U
7440702	Calcium	6.3	ug/L	U
7440473	Chromium	6.3	ug/L	U
7440484	Cobalt	6.3	ug/L	U
7440508	Copper	3.8	ug/L	U
7439896	Iron	13	ug/L	U
7439954	Magnesium	25	ug/L	U
7439965	Manganese	1.3	ug/L	U
7440020	Nickel	13	ug/L	U
7440097	Potassium	880	ug/L	U
7440235	Sodium	25	ug/L	U
7440622	Vanadium	3.8	ug/L	U
7440666	Zinc	5.0	ug/L	U

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

Analytes				
7440360	Antimony	0.63	ug/L	U
7440382	Arsenic	0.63	ug/L	U
7439921	Lead	0.13	ug/L	U
7782492	Selenium	1.3	ug/L	U
7440224	Silver	0.037	ug/L	U
7440280	Thallium	0.63	ug/L	U

Project Code:	TEC-723A	**Collected:**	
Project Name:	BLACK BUTTE MINE	**Matrix:**	Liquid-Total
Project Officer:	MARK ADER	**Sample Number:**	MXW980929
Account Code:	98T10PFAX10ZZLA00	**Type:**	Spike Blank
Station Description:			

MET

Parameter : Metals, ICP-SAS
Method : 200.7-M Inductively Coupled Plasma-Atomic Emission Spectrometry, CLP ILM3.0
Prep Method: 200.8 MOD

Analytes		Result	Units	Qlfr
7440702	Calcium			NA
7439954	Magnesium			NA
7440097	Potassium			NA
7440235	Sodium			NA
7429905	Aluminum	102	%Rec	
7440393	Barium	101	%Rec	
7440417	Beryllium	104	%Rec	
7440439	Cadmium	99	%Rec	
7440473	Chromium	103	%Rec	
7440484	Cobalt	101	%Rec	
7440508	Copper	101	%Rec	
7439896	Iron	104	%Rec	
7439965	Manganese	102	%Rec	
7440020	Nickel	104	%Rec	
7440622	Vanadium	106	%Rec	
7440666	Zinc	101	%Rec	

Parameter : Metals, ICP/MS
Method : 200.8 MOD
Prep Method: 200.8 MOD

Analytes				
7440360	Antimony	101	%Rec	
7440382	Arsenic	100	%Rec	
7439921	Lead	97	%Rec	
7782492	Selenium	102	%Rec	
7440224	Silver	97	%Rec	
7440280	Thallium	95	%Rec	

XW980929A Spike Blank