Gold Hill and Iowa Mines
Preliminary Assessment/Site Inspection Report

TDD: 05-02-0004

EPA Contract: 68-S0-01-02

February 2006

EPA Region X

START

Superfund Technical Assessment and Response Team

Weston Solutions, Inc. · 190 Queen Anne Avenue North · Seattle, WA 98109-4926

06-0018 Cover.ai

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

March 22, 2006

Reply To
Attn Of: ECL-115

John Parrish and Bill Rodman
2327 Mountain View Drive
Boise, ID 83706

Re: Gold Hill and Iowa Mines

Dear Mr. Parrish and Mr. Rodman:

The U.S. Environmental Protection Agency (EPA), through its contractor, Weston Solutions, Inc., has completed a report summarizing the findings of a field sampling visit conducted at the Gold Hill and Iowa Mine sites in November, 2005. A copy of the report, called a Preliminary Assessment/Site Inspection (PA/SI), is enclosed.

EPA will continue to evaluate the information in the PA/SI and any additional information in coordination with the Idaho State Department of Environmental Quality (DEQ). EPA and DEQ's continued evaluation does not relieve your facility from complying with appropriate Idaho state regulations.

We appreciate your cooperation during the site visit. If you have any questions, please feel free to contact me directly at (206)553-2782.

Sincerely,

Ken Marcy
Superfund Site Assessment Manager
USEPA Region 10

cc: Craig Conant, USEPA
Bruce Schuld, IDEQ

PRELIMINARY ASSESSMENT/SITE INSPECTION REPORT

Gold Hill and Iowa Mines Preliminary Assessment/Site Inspection
Boise County, Idaho

TDD: 05-02-0004

Submitted To:

Ken Marcy, Task Monitor
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

Prepared By:

Weston Solutions, Inc.
190 Queen Anne Avenue North, Suite 200
Seattle, WA 98109

February 2006

Contract No.: 68-S0-01-02
Weston Work Order No.: 12644-001-002-0168-00

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LIST OF ACRONYMS

Acronym	Definition
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cm/s	centimeters per second
CLP	Contract Laboratory Program
CLP-SOW	Contract Laboratory Program Statement of Work
COC	Contaminant of Concern; Chain of Custody
CRQL	Contract-Required Quantitation Limit
DQI	Data Quality Indicator
DQO	Data Quality Objective
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GPS	Global Positioning System
HRS	Hazard Ranking System
ICDC	Idaho Conservation Data Center
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDW	Investigation-Derived Waste
IDWR	Idaho Department of Water Resources
LCS	laboratory control sample
MCDC	Missouri Census Data Center
MDL	method detection limit
mg/kg	milligrams per kilogram
MQO	Method Quality Objective
NPL	National Priorities List
PA	Preliminary Assessment

LIST OF ACRONYMS *(Continued)*

Acronym	Definition
PA/SI	Preliminary Assessment/Site Inspection
PPE	Probable Point of Entry
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RPD	relative percent difference
RSCC	Regional Sample Control Coordinator
SARA	Superfund Amendments and Reauthorization Act
SQAP	Sampling and Quality Assurance Plan
SQL	sample quantitation limit
START-2	Superfund Technical Assessment and Response Team
TAL	Target Analyte List
TDD	Technical Direction Document
TDL	Target Distance Limit
USCB	United States Census Bureau
USCS	Unified Soil Classification System
USFS	United States Forest Service
USGS	United States Geological Survey
Weston	Weston Solutions, Inc.
WRCC	Western Regional Climate Center
XRF	X-Ray Fluorescence

SECTION 1

INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the 1986 Superfund Amendments and Reauthorization Act (SARA), Weston Solutions, Inc. has completed a Preliminary Assessment and Site Inspection (PA/SI) of the Gold Hill and Iowa Mines located in the historical Boise Basin Mining District (Figure 1-1). The United States Environmental Protection Agency (EPA) Region 10 tasked Weston Solutions, Inc. to complete this PA/SI pursuant to the EPA Superfund Technical Assessment and Response Team (START-2) Contract No. 68-S0-01-02 and Technical Direction Document (TDD) No. 05-02-0004. The purpose of this report is to provide the EPA with the background information collected for the site, to discuss the sampling activities conducted and the data collected during the PA/SI, and to present the analytical results from the data obtained as part of the investigation.

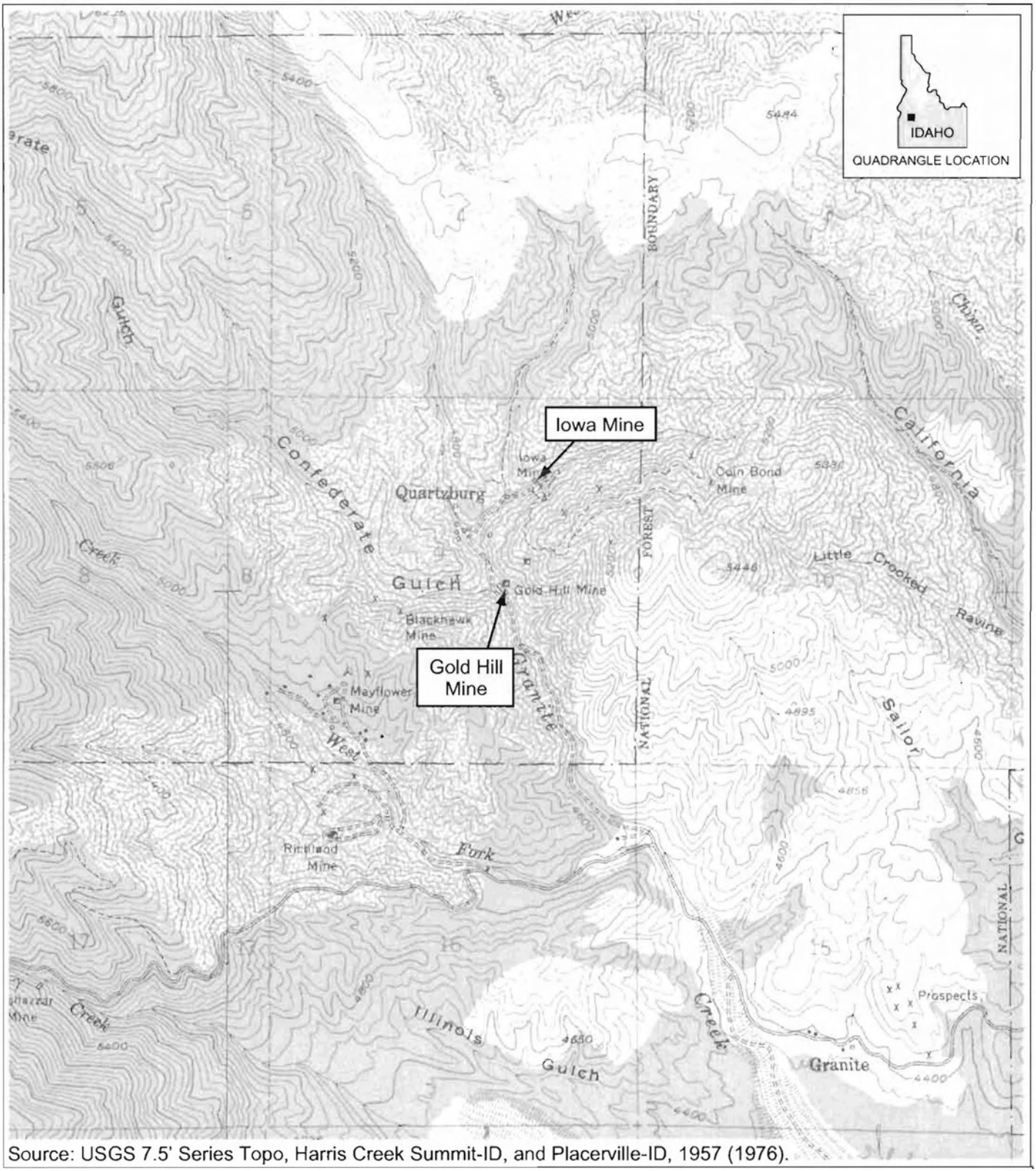
The PA/SI, under the authority of CERCLA and SARA, is intended to collect sufficient data to determine a site's potential for inclusion on the National Priorities List (NPL) and establish priorities for additional action, if warranted.

The Gold Hill and Iowa Mines were referred by the Idaho Department of Environmental Quality (IDEQ) to the EPA for assessment under CERCLA. A Preliminary Assessment of the mines was performed by IDEQ in 2004. Previous environmental sampling at the Gold Hill and Iowa Mines was limited primarily to site surface waters. To build upon the PA performed by IDEQ, EPA requested a combined PA/SI be completed at the site to determine if releases of hazardous substances are occurring and if there is a potential for releases to affect human health or the environment. Accordingly, the sampling objectives defined for the Gold Hill and Iowa Mines PA/SI are to:

- Document the potential threat to public health or the environment posed by the site;
- Determine the potential for a release of hazardous constituents into the environment;
- Assess the need for additional detailed investigation and/or response action at the site; and
- Provide the EPA with the adequate information to determine whether the site is eligible for placement on the NPL.

This document includes site background information (Section 2); field sampling activities and analytical protocols (Section 3); quality assurance/quality control (QA/QC) criteria (Section 4); analytical results reporting and background sampling (Section 5); potential source characterization (Section 6); migration and exposure pathways and targets (Section 7); summary and conclusions (Section 8); and references (Section 9).

Any use of this document or the information contained herein by persons or entities other than the EPA Region 10 shall be at the sole risk and liability of said person or entity. START-2, therefore, expressly disclaims any liability to persons other than the EPA Region 10.



Source: USGS 7.5' Series Topo, Harris Creek Summit-ID, and Placerville-ID, 1957 (1976).

Site Location Map
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Figure
1-1

06-0018 Fig1-1.ai

SECTION 2

SITE BACKGROUND

2.1 SITE LOCATION

Site Name:	Gold Hill and Iowa Mines
CERCLIS ID No.	NA
Location:	Approximately 25 miles northwest of Boise, Idaho.
Latitude/Longitude:	43.9586° N, 115.985° W
Legal Description:	Section 9, Township 7 N, Range 4 E, Boise Meridian
County:	Boise County, Idaho
Site Owner(s):	John Parrish and Bill Rodman 2327 Mountain View Drive Boise, Idaho 83706

2.2 SITE DESCRIPTION

The Gold Hill and Iowa Mines are located on patented and un-patented land within the mountainous Boise Basin Mining District. The mines are located within 1,500 feet of each other on Granite Creek near the former town of Quartzburg, Idaho. The Boise Basin is approximately 300 square miles in area and is drained by Mores Creek and Grimes Creek, tributaries of the Boise River. Granite Creek is a tributary to Grimes Creek.

The Gold Hill and Iowa mines can be reached from Idaho City, located along State Highway 21, by driving northwest along Forest Road 307, then north along Forest Road 615, and west along Forest Road 343 to a small road that parallels Granite Creek. A locked gate on the small road leading to the mine sites controls public access.

2.3 SITE OWNERSHIP HISTORY

The Gold Hill lode deposit was discovered in 1863 and was worked almost continuously until 1938. In 1931 Talache Mines Inc. acquired the title to the Gold Hill Mine from the Gold Hill and Iowa Mines Company. In 1938 operations at the Gold Hill Mine were suspended and the plant was dismantled.

2.4 SITE OPERATIONS AND SOURCE CHARACTERISTICS

Potential sources include several waste rock/tailings piles and a former mill location observed at the mine sites during the IDEQ Preliminary Assessment (PA) field work and subsequent START-2 PA/SI field effort.

The Gold Hill Mine has two significant tailings piles hereafter named Waste Pile #1 and Waste Pile #2, as shown on Figure 2-1. Waste Pile #1 is located on the northern section of the mine property. Waste Pile #1 is estimated to be 350 feet long, 150 feet wide and 150 feet high. Waste debris has slumped off the pile and built up along the toe of the pile. The pile currently stretches from an old access road to the northeast down to within approximately 50 feet of the current road, which runs along Granite Creek. Waste Pile #2 is located due south of Waste Pile #1 on the same west-facing slope. Waste Pile #2 is estimated to be 300 feet long, 200 feet wide and 200 feet high.

The Iowa Mine consists of many small waste rock piles that have been placed beside the roadway and a spring that fill a former retention pond. The site is significantly smaller than Gold Hill Mine. Waste dumps consist of fine-grained material (2-5 mm diameter) and are organized into three (3) piles that total approximately 200 feet long, 50 feet wide, and 30 feet high (IDEQ 2004).

The former Gold Hill Mine mill location lies between Waste Pile #1 and Waste Pile #2. Details concerning activities conducted at the Gold Hill Mine mill site are vague. It appears that the mill crushed rock and used amalgamation and cyanidation processes for the recovery of gold. Only remnants of the former mill structures and equipment were observed by START-2 personnel.

Contaminants of concern (COCs) associated with the mining activities consist primarily of metals. Waste rock and/or tailings piles at the site may be sources of these metals. Additionally, elemental mercury from possible amalgamation activities may also be present at the site.

2.5 SITE CHARACTERIZATION

2.5.1 Previous Site Investigations

The Gold Hill and Iowa Mines were the subject of a PA performed by IDEQ in 2004 (IDEQ 2004). During the PA, the features of the mine sites were observed and samples were collected for metals analysis, including one soil sample and six surface water samples. A layout map for the mine sites is provided in Figure 2-1.

The PA concluded: "Most structures relating to mining activity have fallen, burned or been covered. Waste rock piles, abandoned machinery, a few standing structures, some decommissioned structures, and the remains of a few collapsed adits can be seen in the area. No adits remain open and the majority of the existing structures are properly restricted with locking gates and warning signs…A soil sample taken from the toe of the tailings pile at the Gold Hill Mine did not contain elevated concentrations of any constituents of concern. All but one of the

water samples...collected throughout the drainage showed no significant signs of overall water quality degradation."

"One water sample...contained elevated levels of arsenic at 0.841 mg/L. The MCL for arsenic is 0.010 mg/L. However, this concentration occurred near the toe of Waste Pile #1 at the Gold Hill Mine, and water quality samples down gradient in Granite Creek meet the MCL criteria. Based on the limited sampling of this investigation, it appears risk to potential receptors is limited to the small area in which the sampled water is exposed at the surface. This area is relatively small and confined to the toe of Waste Pile #1 which is located within a fenced drainage where human access is limited. The receptors of greatest concern are wildlife, as they may drink the water that showed elevated arsenic concentrations and later be consumed by humans."

2.6 SUMMARY OF PA/SI INVESTIGATION LOCATIONS

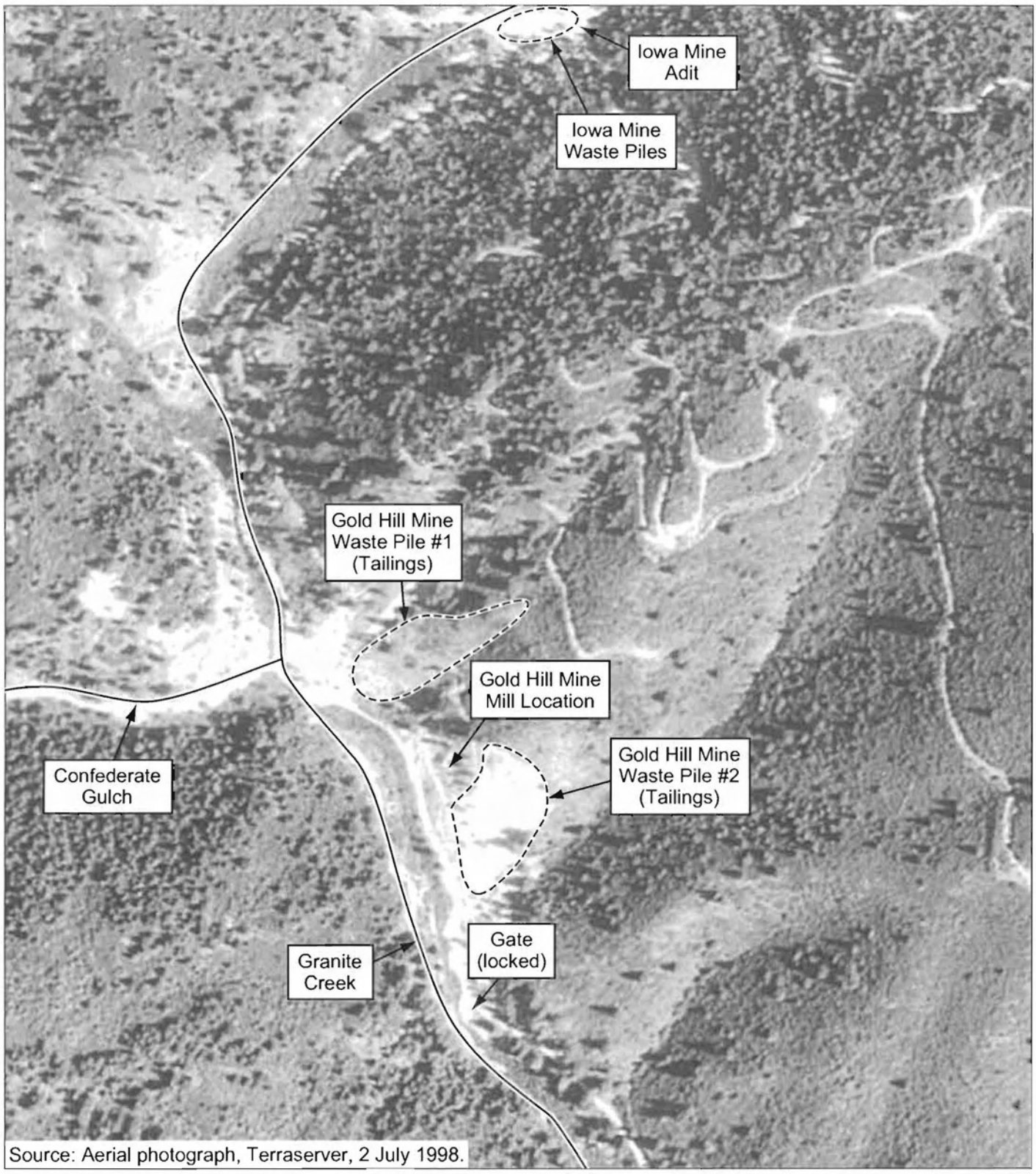
Sampling under the PA/SI was conducted at those areas considered to be potential contamination sources and at areas that may have been contaminated through the migration of hazardous substances from sources on site. Based on a review of background information and discussions with site representatives, the following areas or features have been identified for inspection under the Gold Hill and Iowa Mines PA/SI:

2.6.1 Potential Sources

- **Waste Piles.** Two tailings piles are located at the Gold Hill Mine site. Three waste rock piles are located at the Iowa Mine site. These tailings and waste rock piles are associated with mill production and mine development activities. These tailings and waste rock piles are a potential source of contamination. Potential contaminants of concern include target analyte list (TAL) metals.
- **Mill Location.** The former Gold Hill Mine mill is a potential source of contamination. The mill area was used to crush rock and recover gold using amalgamation and cyanide heap-leaching processes. Potential contaminants of concern include TAL metals. Cyanide was not included as a COC based on the length of time that milling operations have been inactive and the mobility of cyanide in the environment.

2.6.2 Potential Receptors

- **Threatened and Endangered Species.** Bald Eagle *(Haliaeetus leucocephalus)*, a federal- and state-listed threatened species, potentially utilizes habitat within the 15-mile TDL of the site.



Site Layout Map
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

N

0 150 300

Approximate Scale in Feet

--- Tailings and Waste Pile Outline

WESTON SOLUTIONS

Figure
2-1

06-0018 Fig2-1.ai

SECTION 3

FIELD ACTIVITIES AND ANALYTICAL METHODS

START-2 developed a Sampling and Quality Assurance Plan (SQAP) for the Gold Hill and Iowa Mines site in October 2005, before commencement of field activities (Weston 2005). START-2 developed the SQAP based on background information. The SQAP describes the sampling strategy, sampling methods, and analytical protocols to investigate potential hazardous substance sources and potential targets. With few exceptions, the PA/SI field activities were conducted in accordance with the approved SQAP. Deviations from the SQAP are described, when applicable, in the sampling location discussion in Section 6 (source areas) and Section 7 (target areas).

The PA/SI field-sampling event was conducted on November 8 through 10, 2005. The field-sampling event included the collection of two background samples, six source samples, four PPE sediment samples, 16 sediment samples, and two attribution sediment samples. Methods for collection by sample type are described below. A summary of laboratory analysis conducted on all 30 samples collected in the PA/SI are presented in Table 3-1. Photographic documentation of the PA/SI field activities is presented in Appendix A.

The locations of all samples collected and analyzed during the PA/SI are presented on Figures 3-1 and 3-2. In addition to field samples collected for laboratory analysis, field screening utilizing x-ray fluorescence spectrometry (XRF) was completed during the field activities. The XRF was used to select samples to be sent to the laboratory for analysis. The results from the XRF screening are provided in Table 3-2. The sample collection locations were documented using Global Positioning System (GPS) unit. Uncorrected and corrected GPS coordinates are presented in Appendix B. Laboratory analytical data sheets are included in Appendix C.

Samples were tracked with a field sampling code system designed to allow for easy reference to the sample's origin and type. The field sample number (e.g., GHM-SS-BG001-0003) used by START-2 personnel on each sample location are also used in this report. Table 3-3 summarizes the field sampling code.

3.1 SAMPLING METHODS

Material unsuitable for analysis, such as grass, leaves, other vegetative materials, and rocks were removed from the sample material before placement into sample containers. Sample material was homogenized in a dedicated polyethylene bowl prior to placement into sample containers. All samples were stored in iced coolers under the custody of START-2 personnel until shipped to the analytical laboratory.

3.1.1 Surface Soil Samples

All soil samples were collected from 0 to 4 inches below ground surface (bgs). Surface soil samples were collected in accordance with START-2 SOP RFW/R10-001, except that field duplicates were not collected. The sand-sized and finer fractions of the soil were targeted for collection. Surface soil samples were passed through a 10-mesh sieve in order to isolate the finer fractions of the soil. All samples were collected with a long-handled polyethylene spoon and homogenized in a dedicated polyethylene bowl. All sample aliquots were classified according to the Unified Soil Classification System (USCS). The sample descriptions were recorded on a standardized field sampling form. Samples were stored in an iced cooler prior to shipment to the analytical laboratory. Evidence of contamination (e.g., staining) was noted on the field sampling form.

3.1.2 Surface Sediments Samples

All surface sediment samples were collected from 0 to 6 inches bgs. The majority of the samples were collected in accordance with START-2 SOP RFW/R10-003, except that field duplicates were not collected. The majority of the sediment samples were collected with a long-handled polyethylene spoon and homogenized in a dedicated polyethylene bowl. To minimized cross-contamination, samples were collected from downstream reaches of the creeks, working back upstream. All sample aliquots were classified according to the USCS. The sample descriptions were recorded on a standardized field sampling form. Samples were stored in an iced cooler prior to shipment to the analytical laboratory.

In addition to the sediment samples collected directly from the creeks, some sediment samples were collected utilizing a portable 2-inch gold dredge. The samples collected using the portable dredge were collected by inserting the tip of the dredge's suction nozzle into pockets in the stream bed until the top of bedrock was reached. The goal of the sediment sample collection utilizing the portable dredge was to collect samples from within 2 inches of the bedrock surface. In areas where shallow bedrock was not present, the samples were collected from as near to bedrock as possible. Small boulders and cobbles were moved during the collection of these samples in order to provide access to the sample locations. After a representative amount of sediment had been collected in the dredge sluice box, the sample was collected from the bed of the sluice box using a dedicated polyethylene spoon and homogenized in a dedicated polyethylene bowl. All sample aliquots were classified according to the USCS. The sample descriptions were recorded on a standardized field sampling form. Samples were stored in an iced cooler prior to shipment to the analytical laboratory.

3.1.3 XRF Screening Methodology

An XRF unit was used to screen samples prior to shipment to the analytical laboratory. XRF screening results for arsenic, cadmium, lead, mercury, and nickel were recorded. Samples with the highest levels of these metals were selected from shipment to the analytical laboratory. The XRF screening process was not completed in-situ.

3.2 ANALYTICAL PROTOCOLS

Analyses performed on all PA/SI samples consisted of TAL metals. One laboratory performed analysis of samples collected during the PA/SI. Chemtech Consulting, located in Mountainside, New Jersey, performed TAL metals analysis. All analysis were conducted following EPA protocols.

3.3 SAMPLE GLOBAL POSITIONING SYSTEM LOCATIONS

A Trimble GeoExplorer GPS unit with data logger was used to record the coordinates of the PA/SI sample locations. In some cases, adequate satellite coverage was not available at the time of sampling and coordinates were not measured. Logged location data was stored in individual files within the GPS unit and recorded on the appropriate field sampling form. Data from the GPS unit was downloaded by START-2 personnel and e-mailed to Mr. Matt Gubitosa at the EPA. Mr. Gubitosa conducted differential corrections of the data to improve location accuracy. Uncorrected and corrected GPS coordinates are presented in Appendix B.

3.4 INVESTIGATION DERIVED WASTE

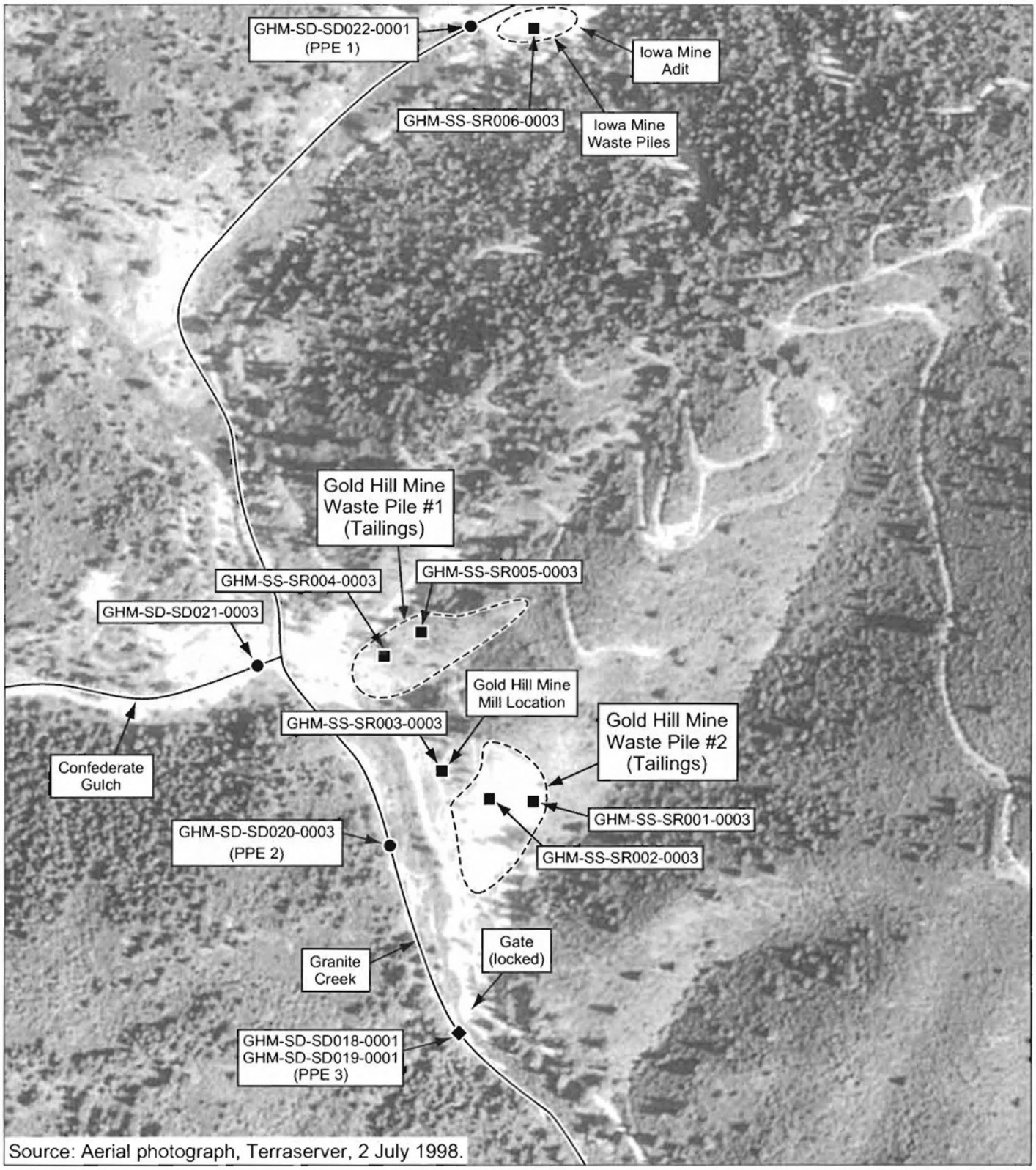
Investigation-derived waste (IDW) generated during the PA/SI sampling effort consisted of used disposable sampling equipment (e.g. bowls, spoons, and protective gloves) and a 5-gallon bucket of mixed soil and decontamination water. All disposable equipment and used gloves were disposed as municipal solid waste in off-site dumpsters. The 5-gallon bucket of IDW was characterized and disposed as non-RCRA waste by Emerald Services of Seattle, Washington.

3.5 SAMPLE HANDLING AND CUSTODY

All chain-of-custody requirements complied with the START-2 Standard Operating Procedures for sample handling and sample control. Chain-of-custody procedures followed the *Contract Laboratory Program Guidance for Field Samplers* (EPA 2004a). Information obtained during sampling was recorded in the project daily log and data forms in accordance with the SQAP. Samples were also documented with photographs, including sampling location and site features, as deemed appropriate.

3.6 SAMPLE IDENTIFICATION

A sample information summary on Table 3-1 provides analyses information as well as the sample numbers assigned by the EPA Regional Sample Control Coordinator (RSCC). In addition to the sample numbers assigned by the EPA RSCC, all samples collected were assigned a unique START-2 identification code based on a consistent sample designation scheme that was used internally by START-2 personnel and within this report. The sample designation scheme was designed to suit the needs of the field staff, data management, and data users and was not provided to the analytical laboratory. Table 3-3 summarizes the field sampling code.



Source: Aerial photograph, Terraserver, 2 July 1998.

On-Site Sample Location Map
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

0 150 300

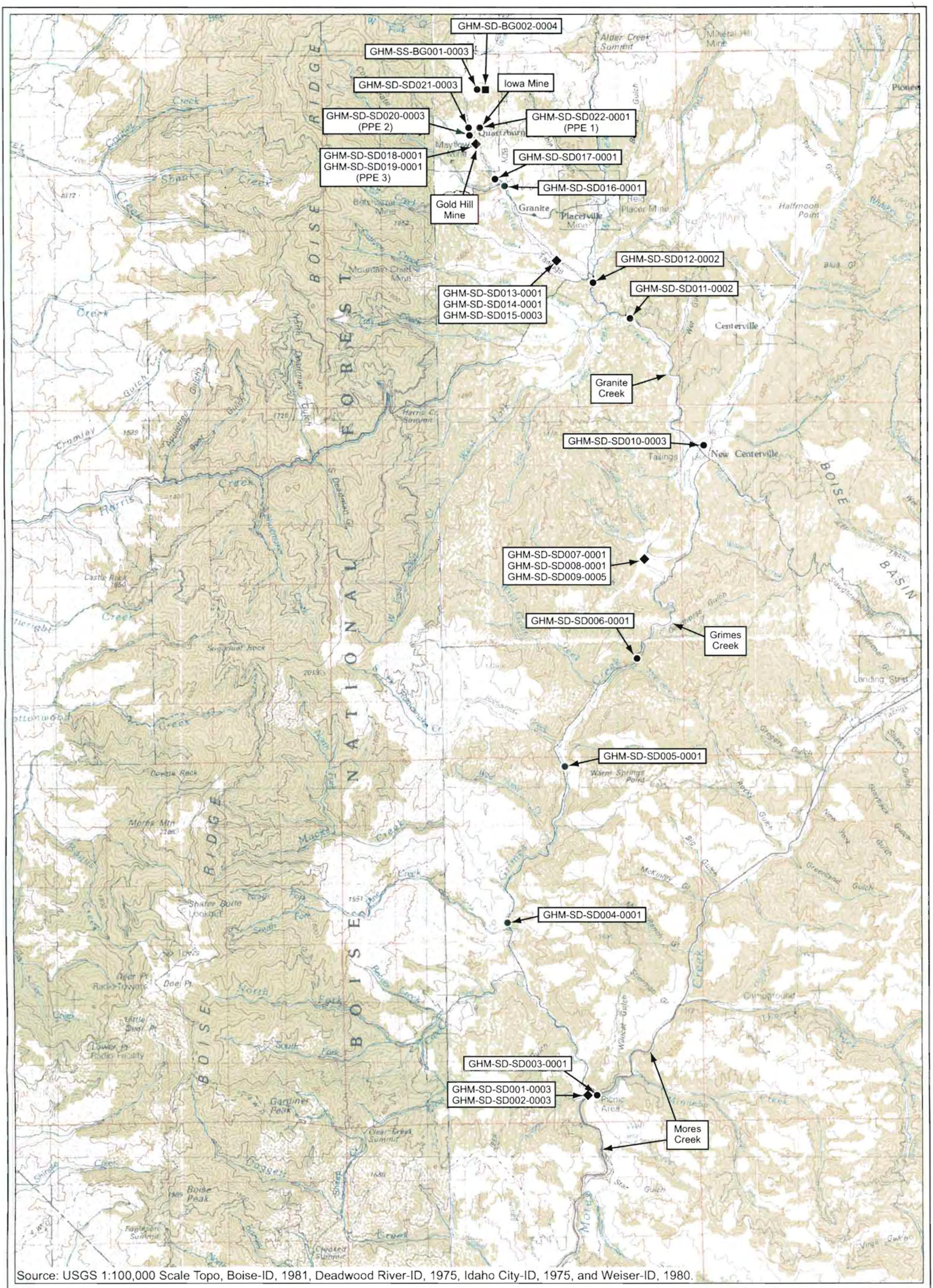
Approximate
Scale in Feet

- ◆ Dredge Sediment/Sediment Sample Location
- ● Sediment Sample Location
- ■ Soil Sample Location
- – – – Tailings and Waste Pile Outline

WESTON SOLUTIONS

Figure
3-1

06-0018 Fig3-1.ai



Source: USGS 1:100,000 Scale Topo, Boise-ID, 1981, Deadwood River-ID, 1975, Idaho City-ID, 1975, and Weiser-ID, 1980.

0 0.75 1.5

Scale in Miles

- ◆ Dredge Sediment/Sediment Sample Location
- ● Sediment Sample Location
- ■ Soil Sample Location

Off-Site Sample Location Map
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Figure
3-2

06-0018 Fig3-2.ai

Table 3-1—Sample Information Summary
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

START-2 Sample Number	Description	Depth Interval (inches)	EPA Regional Tracking Number	CLP Sample Number	Sample Date	Analyses Conducted
						TAL Metals
Background Samples						
GHM-SS-BG001-0003	Surface Soil (Unnamed tributary to Granite Creek)	0-4	05454272	MJ6A11	11/09/2005	X
GHM-SD-BG002-0004	Sediment (Unnamed tributary to Granite Creek)	0-5	05454273	MJ6A12	11/09/2005	X
Source Samples						
GHM-SS-SR001-0003	Gold Hill Mine Waste Pile #2	0-4	05454274	MJ6A13	11/10/05	X
GHM-SS-SR002-0003	Gold Hill Mine Waste Pile #2	0-4	05454275	MJ6A14	11/10/05	X
GHM-SS-SR003-0003	Gold Hill Mine Mill Location	0-4	05454276	MJ6A15	11/10/05	X
GHM-SS-SR004-0003	Gold Hill Mine Waste Pile #1	0-4	05454277	MJ6A16	11/10/05	X
GHM-SS-SR005-0003	Gold Hill Mine Waste Pile #1	0-4	05454278	MJ6A17	11/10/05	X
GHM-SS-SR006-0003	Iowa Mine Waste Piles	0-4	05454279	MJ6A18	11/10/05	X
PPE Sediment Samples						
GHM-SD-SD018-0001	Granite Creek PPE 3 at Toe of Gold Hill Mine Waste Pile #2 (Dredge Sample)	0-2	05454267	MJ6A06	11/9/05	X
GHM-SD-SD019-0001	Granite Creek PPE 3 at Toe of Waste Pile #2 (Co-located with Sample GHM-SD-SD018-0001)	0-2	05454268	MJ6A07	11/9/05	X
GHM-SD-SD020-0003	Granite Creek PPE 2 at Toe of Gold Hill Mine Waste Pile #1	0-4	05454269	MJ6A08	11/9/05	X
GHM-SD-SD022-0001	Granite Creek PPE 1 at Iowa Mine Waste Piles	0-1	04424071	MJ6A10	11/9/05	X
Stream Sediment Samples						
GHM-SD-SD001-0003	Mores Creek Sediment (Dredge Sample)	0-4	05454250	MJ69Y9	11/08/2005	X
GHM-SD-SD002-0003	Mores Creek Sediment (Co-located with Sample GHM-SD-SD001-0003)	0-4	05454251	MJ69Z0	11/08/2005	X
GHM-SD-SD003-0001	Mores Creek Sediment (Attribution)	0-1	05454252	MJ69Z1	11/08/2005	X
GHM-SD-SD004-0001	Grimes Creek Sediment	0-2	05454253	MJ69Z2	11/08/2005	X
GHM-SD-SD005-0001	Grimes Creek Sediment	0-2	05454254	MJ69Z3	11/08/2005	X
GHM-SD-SD006-0001	Grimes Creek Sediment	0-2	05454255	MJ69Z4	11/08/2005	X
GHM-SD-SD007-0001	Grimes Creek Sediment (Dredge Sample)	0-2	05454256	MJ69Z5	11/08/2005	X
GHM-SD-SD008-0001	Grimes Creek Sediment (Co-located with Sample GHM-SD-SD007-0001)	0-2	05454257	MJ69Z6	11/08/2005	X
GHM-SD-SD009-0005	Grimes Creek Sediment (Co-located with Sample GHM-SD-SD007-0001)	0-6	05454258	MJ69Z7	11/08/2005	X
GHM-SD-SD010-0003	Grimes Creek Sediment	0-4	05454259	MJ69Z8	11/08/2005	X
GHM-SD-SD011-0002	Granite Creek Sediment	0-3	05454260	MJ69Z9	11/08/2005	X
GHM-SD-SD012-0002	Granite Creek Sediment	0-3	05454261	MJ6A00	11/08/2005	X
GHM-SD-SD013-0001	Granite Creek Sediment (Dredge Sample)	0-2	05454262	MJ6A01	11/08/2005	X
GHM-SD-SD014-0001	Granite Creek Sediment (Co-located with Sample GHM-SD-SD013-0001)	0-2	05454263	MJ6A02	11/08/2005	X
GHM-SD-SD015-0003	Granite Creek Sediment (Co-located with Sample GHM-SD-SD013-0001)	0-4	05454264	MJ6A03	11/08/2005	X
GHM-SD-SD016-0001	Granite Creek Sediment	0-2	05454265	MJ6A04	11/09/2005	X
GHM-SD-SD017-0001	Granite Creek Sediment	0-2	05454266	MJ6A05	11/09/2005	X
GHM-SD-SD021-0003	Confederate Gulch (Attribution)	0-4	05454270	MJ6A09	11/09/2005	X

Notes:
CLP: Contract Laboratory Program.
TAL: Total analytes list.

Table 3-2—XRF Field Screening Results
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

XRF Screening Location	Screening Results (mg/kg)					Selected for Laboratory Analysis
	Arsenic	Cadmium	Mercury	Nickel	Lead	
Gold Hill - Waste Pile #2						
1	29	<30	<8	<38	59	
2	89	<52	<18	<78	89	
3	47	ND	<15	<69	41	
4	108	<51	<18	<72	277	
5	221	<46	<16	<67	67	
6	29	<49	<13	<72	47	
7	33	<51	<14	<70	89	
8	35	<48	<13	<69	67	
9	44	<51	<16	<77	118	
10	112	<51	<19	<70	371	X
11	25	<50	<14	<69	116	
12	31	<48	<15	<68	81	
13	22	ND	<16	<69	71	
14	62	<51	<14	<75	197	
15	13	<40	<13	<68	38	
Gold Hill - Mill Site						
16	144	<50	<18	<78	408	
17	34	<51	<16	<77	194	
18	37	<48	18	<69	140	X
19	75	<53	<19	<84	229	
20	<14	<43	<12	<72	101	
21	16	<51	<15	<67	61	
22	17	<38	<11	<48	36	
23	33	ND	<19	<124	201	
24	87	ND	<16	<78	266	
25	69	<54	<17	<81	131	
26	54	<48	<15	<75	183	
27	67	<51	<16	<85	113	
Gold Hill - Waste Pile #1						
28	24	<43	<13	<60	79	
29	18	<49	<13	<71	56	
30	52	<52	<16	<78	120	
31	17	<50	<16	<75	<15	
32	176	<50	<17	<72	293	X
33	50	<47	<15	<62	62	
34	26	<48	<14	<62	126	
35	135	<48	<16	<76	219	
36	36	<49	<15	<67	62	
37	162	<48	<17	<65	392	X
38	71	<50	<17	<75	186	
39	<14	ND	<15	<82	47	
40	28	ND	<17	<85	67	
41	69	<49	<16	<74	80	
42	215	<55	<17	<80	259	

Table 3-2—XRF Field Screening Results
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

XRF Screening Location	Screening Results (mg/kg)					Selected for Laboratory Analysis
	Arsenic	Cadmium	Mercury	Nickel	Lead	
Iowa Mine - Waste Pile						
43	30	<51	<14	<67	62	
44	46	<51	<15	<67	87	
45	20	<51	<16	<68	54	
46	37	ND	<14	<67	70	
47	19	<47	<14	<62	61	
48	60	ND	<17	<74	76	
49	72	<54	<15	<72	116	
50	70	ND	<18	<73	81	
51	43	<48	<15	<65	150	X
52	<18	ND	<15	<66	135	
53	79	<52	<18	<80	113	
54	49	<52	<15	<76	65	
55	43	<52	<17	<78	66	
56	28	ND	<13	<74	65	
57	25	<49	<14	<67	101	

Notes:

ND: Not detected.

mg/kg: milligrams per kilogram.

XRF: X-ray fluorescence.

Table 3-3—Field Sample Identification Code
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Digits	Descriptions	Code Example
1,2,3	Site ID	GHM (Gold Hill Mine)
4,5	Media Code	SD (Sediment)
		SS (Surface Soil)
		WT (Water)
6,7	Station Code	BG (Background)
		SD (Stream Sediment)
		SR (Source)
		IW (Investigative-Derived Waste)
8,9,10	Consecutive Sample Number	001 (First Sample of Station Code)
11	Sample Type	0 (Field Sample)
		2 (Trip Blank)
		4 (Equipment Rinsate Blank)
		5 (Split Sample)
12,13,14	Sample Depth (feet bgs)	000 (0 ft bgs = surface sample)
		015 (1.5 ft bgs)

Notes:
bgs: below ground surface

SECTION 4

QUALITY ASSURANCE/QUALITY CONTROL

In order to ensure data quality objectives are met, data quality indicators are evaluated to determine sample and laboratory performance. These data, known as 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 due to sample collection, preparation, and analysis activities.

Specific QC requirements for laboratory analyses are incorporated in the *Contract Laboratory Program Statement of Work (CLP-SOW) for Inorganic Analysis ILM05.3* (EPA 2004b).

The QC requirements or scope of work requirements were followed for analytical results reported for the *Gold Hill and Iowa Mines PA/SI SQAP* (Weston 2005). This section describes the QA/QC measures followed for sample analysis associated with the PA/SI and provides an evaluation for the end-user regarding usability of the data presented in this report.

All samples were collected following the procedures outlined in the site-specific SQAP prepared for this PA/SI (Weston 2005). One laboratory conducted the chemical analysis of samples collected during the PA/SI.

- Chemtech Consulting Group, located in Mountainside, New Jersey, analyzed 31 soil/sediment samples and 3 water samples for total recoverable metals following specifications in the USEPA *CLP-SOW for Inorganic Analysis ILM05.3* (EPA 2004b).

EPA quality assurance chemists reviewed all data from analyses performed by CLP laboratories. Weston validated these data relative to project data quality objectives (DQOs). Data qualifiers were applied following the *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA 2004c), and/or criteria specified in the individual analytical methods.

4.1 SATISFACTION OF DATA QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

The project data quality objectives for the field effort were designed to produce data of known and documented quality in order to characterize sources, determine off-site migration of contaminants, determine whether the site is eligible for placement on the NPL, and to document threat(s) or potential threat(s) to public health or the environment posed by the site. The DQO process applied to this project followed that described in the EPA document, *Guidance for the Data Quality Objectives Process EPA QA/G-4*, (EPA 2000a).

All samples collected during the PA/SI investigation were analyzed using definitive analytical methods, and EPA accepted all analytical methods employed for this project. The data generated

for this project met or exceeded requirements for the definitive data category as defined in The EPA document, *Guidance for the Data Quality Objectives Process for Hazardous Waste Site Operations EPA QA/G-4HW*, (EPA 2000b).

A detailed discussion of the project quality objectives achieved during the PA/SI is presented in the following sections.

4.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Quality control checks for sample collection were evaluated by a combination of Chain-of-Custody protocols and laboratory quality assurance as prescribed in the sampling or analytical methods. Quality control samples (e.g., matrix spike/duplicate spike samples, rinsate samples, field blanks) at a frequency of one per 20 samples (or per method) per media were collected during the PA/SI field effort. Results from these samples were compared to each method's criteria and to criteria specified in the SQAP (Weston 2005).

All of the analyses conducted during this project yielded definitive data. Data quality indicator targets for this project are specified below—DQOs are summarized in the SQAP. Bias on estimated, qualified data was determined and/or confirmed through the validation process. The laboratories' DQO for completeness was 95% for aqueous samples and 90% for soil/sediment samples. Precision and accuracy requirements are also outlined in the SQAP (Weston 2005).

4.3 PROJECT-SPECIFIC DATA QUALITY OBJECTIVES

Data quality indicator (DQI) goals—precision, accuracy, representativeness, comparability, and completeness—for this project were developed following guidelines presented in EPA *Guidance for Quality Assurance Project Plans, EPA QA/G-D* (EPA 2002). The basis for assessing each of the elements of data quality is discussed in the following subsections. Quality assurance objectives for measurement of analytical data (Method Quality Objectives; MQOs) and QC guidelines for precision and accuracy are presented in the SQAP (Weston 2005). Other DQI goals are included in EPA analytical methods employed.

The laboratory and field team were able to meet overall project DQO goals.

4.3.1 Precision

Precision measures the reproducibility of measurements. It is strictly defined as the degree of mutual agreement among independent measurements as the result of repeated application of the same process under similar conditions.

Analytical precision is the measurement of the variability associated with duplicate (two) or replicate (more than two) analyses. When recovery results between different analytical delivery groups are compared, the laboratory control sample (LCS) may be used to determine the precision of the analytical method. In this case, the comparison is not between a sample and a duplicate sample analyzed in the same batch. Rather, the comparison is between the sample and samples analyzed in previous delivery groups. A LCS may be prepared and analyzed within a

given batch; in this case, the analytical precision is associated with a particular preparation and analysis sequence.

Total precision is the measurement of the variability associated with the entire sampling and analysis process for one sampling event. It is determined by analysis of duplicate or replicate field samples and measures variability introduced by both the laboratory and field operations. Field duplicate samples and matrix duplicate spiked samples may be analyzed to assess field and analytical precision, and the precision measurement is determined using the relative percent difference (RPD) between the duplicate sample results.

The laboratory was able to meet project DQOs, with the exceptions described in Section 4.4.6.

4.3.2 Accuracy

Accuracy is a statistical measurement of correctness and includes components of random error (variability due to imprecision) and systemic error. It reflects the total error associated with a measurement. A measurement is accurate when the value reported does not differ from the true value or known concentration of the spike or standard. Analytical accuracy is measured by comparing the percent recovery of analytes spiked into an LCS (blank spike) or into a field sample (to prepare a matrix-spiked sample or matrix-spiked duplicate sample) to a control limit.

The laboratory was able to meet project DQOs.

4.3.3 Representativeness

Representativeness is a measure of the degree to which data accurately and precisely represent a population, including a sampling point, a process condition, or an environmental condition. Representativeness is the qualitative term that should be evaluated to determine that measurements are made and physical samples collected at locations and in a manner resulting in characterizing a matrix or media. Subsequently, representativeness is used to ensure that a sampled population represents the target population and an aliquot represents a sampling unit.

The field team was able to meet project DQOs.

4.3.4 Comparability

Comparability is the qualitative term that expresses the measure of confidence that two data sets or delivery groups can contribute to a common analysis and evaluation. Comparability with respect to laboratory analyses pertains to method type comparison, holding times, stability issues, and aspects of overall analytical quantitation. The following items are evaluated when assessing data comparability:

- Determining if two data sets or delivery groups contain the same set of parameters.
- Determining if the units used for each data set are convertible to a common metric.
- Determining if similar analytical procedures and quality assurance were used to collect data for both data sets.

- Determining if the analytical instruments used for both data sets have approximately similar detection levels.
- Determining if samples within data sets were selected and collected in a similar manner.

To ensure comparability of data collected during this investigation to other data that may have been or may be collected for the site, standard sample collection and measurement techniques were used. The field team was able to meet project DQOs.

4.3.5 Completeness

Completeness is calculated for the aggregation of data for each analyte measured for any particular sampling event or other defined set of samples. Completeness is calculated and reported for each method, matrix, and analyte combination. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. For completeness requirements, valid results are all results not rejected through data validation. The requirement for completeness for this project is 95% for aqueous samples and 90% for soil/sediment samples.

The following formula is used to calculate completeness:

$$\%\ \text{completeness} = \frac{\text{number of valid results}}{\text{number of possible results}}$$

For this investigation, all samples are considered critical. Therefore, standard collection and measurement methods will be used to achieve the completeness goal. All laboratory data were reviewed for usability, and all project data were determined to be useable.

The project DQO of 95% for aqueous samples and 90% for soil/sediment sample for completeness was met.

4.4 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL PARAMETERS

The laboratory data also were reviewed for technical holding time compliance, blank samples contamination, laboratory control sample recovery, interference check sample recovery, duplicate sample analysis, matrix spike sample analysis, and serial dilution performance.

These parameters are described below in more detail. Direction of bias is also described in the following section.

4.4.1 Holding Times

All analyses were completed within the technical holding times.

4.4.2 Blank Sample Results

All blank sample analyses met the frequency and recovery criteria, with the following exceptions.

- Aluminum, copper, cobalt, iron, magnesium, manganese, nickel, and selenium were detected in one or more field and blank samples. The aluminum, copper, cobalt, iron, magnesium, manganese, nickel, and selenium results in samples with results less than 10 times the concentration detected in the associated blank were qualified as non-detected (U) at the reported concentrations.

4.4.3 Calibration Check Sample Analysis

All calibration check sample analyses met acceptance criteria for frequency and recovery.

4.4.4 Laboratory Control Sample Analysis

All laboratory control samples analyzed met frequency and recovery criteria.

4.4.5 Inductively Coupled Plasma-Atomic Emission Spectroscopy—Interference Check Sample Analysis

All ICP-AES interference check sample analyses met frequency and recovery criteria.

4.4.6 Duplicate Sample Analysis

All duplicate sample analysis met frequency and precision criteria, with the following exceptions.

- Iron and manganese exceeded the RPD control limit. Associated detected iron and manganese sample results were qualified as estimated concentrations (J), unknown bias (K).

4.4.7 Matrix Spike Sample Analysis

Matrix spike analysis met frequency and recovery criteria, with the following exceptions.

- Recovery of manganese from the matrix spike sample exceeded the upper control limit. Associated detected manganese results were qualified as estimated concentrations (J), possible high bias (H). Non-detected manganese results were not qualified.

- Recovery of thallium from the matrix spike sample was less than the lower control limit. Associated detected thallium results were qualified as estimated concentrations (J), possible low bias (L). Non-detected thallium results were qualified as non-detected at an estimated quantitation limit (UJ).

4.4.8 Serial Dilutions

All serial dilution analyses met percent difference control limits, with the following exception.

- Zinc had percent difference results greater than the control limit. Associated zinc sample results were qualified as estimated concentrations (J), unknown bias (K).

4.4.9 Detection Limits

For ILM05.3, the laboratory is required to flag all detected results below the Contract Required Quantitation Limit (CRQL) with a 'J' concentration qualifier (result below the CRQL but above the method detection limit; MDL). For consistency with previous START-2 PA/SI reports, and as an aid in the Hazard Ranking System (HRS) scoring, the 'J' concentration qualifier is amended with the 'B' data validation qualifier.

For the Inorganic Functional Guidelines review, the '+' and '-' bias flags are replaced with 'H' and 'L' flags to indicate potential high and low bias, respectively. The 'K' flag is used to indicate unknown bias. This approach is consistent with EPA Region 10 policy.

Bias associated with estimated, non-detected values is unknown and flagged as such, since the reporting limit cannot be determined.

All detection limits met QAPP requirements.

4.4.10 Other Data Assessment

The data, as qualified, are ACCEPTABLE and can be used for all purposes.

SECTION 5

ANALYTICAL RESULTS REPORTING AND BACKGROUND SAMPLES

All soil and sediment analytical results are reported in milligrams per kilogram (mg/kg), which is equivalent to parts per million (ppm). Table 3-1 provides a list of samples collected for laboratory analysis. Sampling locations are presented in Figures 3-1 and 3-2. Laboratory data sheets are included in Appendix C.

5.1 ANALYTICAL RESULTS EVALUATION CRITERIA

Analytical results of samples collected during this PA/SI are presented in summary tables in Sections 6 (source sample reporting) and Section 7 (migration exposure pathways and targets). The first column of each analytical summary table presents background sample concentrations (where appropriate) followed by the analytical results of samples collected for that particular media. The background sample concentrations were used for comparison purposes to determine detections at or above background. Concentrations of analytes reported in soil detected above the sample quantitation limits (SQLs) are presented in bold typeface. Analytical results indicating significant concentrations in source samples (Section 6) with respect to background concentrations are underlined and bold. Similarly, analytical results indicating elevated concentrations of contaminants in target samples (Section 7) with respect to background concentrations are also underlined and bold. For target sample locations, only those analytes that were also detected in a source at the site were evaluated to determine whether their concentrations were elevated. For the purposes of this report, significant/elevated concentrations are those concentrations that are:

- Equal to or greater than the sample's SQL, and
- Equal to or greater than the background sample's SQL when the background concentration is not detected (or is less than the detection limits); or
- At least three times greater than the background concentration when the background concentration equals or exceeds the detection limits.

Based on EPA Region 10 policy regarding common earth crust elements, aluminum, calcium, iron, magnesium, potassium, and sodium are listed in the tables if detected; however, the concentrations were not evaluated or discussed in the text.

5.2 BACKGROUND SAMPLES

Background samples were collected from two naturally occurring media (soil and sediment) from which the PA/SI samples were collected. The results of the background samples are presented in Table 5-1. In addition, results for the appropriate background samples appear as the

first column in the analytical summary tables in Section 6 and Section 7. The locations of the background samples are shown on Figure 3-2.

5.2.1 Background Sample Locations

One background surface soil sample (GHM-SS-BG001-0003) and one background sediment sample (GHM-SD-BG002-0004) were collected during the PA/SI. All background samples were collected upgradient of the Gold Hill and Iowa mining prospects and are used for comparison of all samples.

5.2.2 Background Sample Results

Soil sample GHM-SS-BG001-0003 contained detectable concentrations of barium, chromium, lead, manganese, and zinc. Common earth crust elements were also detected. The soil sample is described as grey, fine to coarse sand, wet with scattered organic matter.

Sediment sample GHM-SD-BG002-0004 contained detectable concentrations of barium, chromium, copper, lead, vanadium, and zinc. Common earth crust elements were also detected. The sediment sample is described as grey silty sand and gravel, moist, with numerous organics.

Table 5-1—Results Summary for Background Samples
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Description	IDEQ Initial Default Target Levels for Soil[1]	Background Surface Soil	Background Sediment
START-2 Sample Number		GHM-SS-BG001-0003	GHM-SD-BG002-0004
EPA Sample Number		05454272	05454273
CLP Sample Number		MJ6A11	MJ6A12
Location		Unnamed Tributary to Granite Creek	Unnamed Tributary to Granite Creek
Metals (mg/kg)			
Aluminum	NA	**2550**	**6750**
Antimony	4.77	7.8 UJK	7.2 U
Arsenic	0.391	0.70 BJK SQL=1.3	**3.5**
Barium	896	**68.1**	**164**
Beryllium	1.63	0.13 BJK SQL=0.65	0.38 BJK SQL=0.6
Cadmium	1.35	0.65 U	0.28 BJK SQL=0.6
Calcium	NA	**782**	**1220**
Chromium	2130	**2.2**	**5.3**
Cobalt	NA	1.5 BJK SQL=6.49	4.2 BJK SQL=3
Copper	921	1.4 BJK SQL=3.25	**4.5**
Iron	5.76	**5350 JK**	**10300 JK**
Lead	49.6	**2.6**	**7.1**
Magnesium	NA	**759**	**1500**
Manganese	223	**118 JH**	**412 JH**
Mercury	0.00509	0.13 U	0.12 U
Nickel	59.1	0.94 UJK	2.9 UJK
Potassium	NA	**660**	**1710**
Selenium	2.03	4.5 U	0.91 UJK
Silver	0.189	1.3 U	1.2 U
Sodium	NA	83.2 BJK	81.0 BJK
Thallium	1.55	3.2 UJK	3.0 UJK
Vanadium	NA	3.9 BJK SQL=6.49	**12.4**
Zinc	886	**31.3 JK**	**63.6 JK**

Notes:

[1] Initial IDEQ Target Levels for Soil were used due to the lack of sediment values for comparison.

Bold type indicates the sample concentration is above its SQL.

BJK: The analyte was positively identified. The associated numerical result is an estimate because the concentration is below the Contract Required Quantitation Limit. Unknown bias.

CLP: Contract Laboratory Program.

IDEQ: Idaho Department of Environmental Quality

JH: The analyte was positively identified. The associated numerical result is an estimate. High bias.

JK: The analyte was positively identified. The associated numerical result is an estimate. Unknown bias.

mg/kg: Milligrams per kilogram.

NA: Not Available.

SQL: Sample Quantitation Limit.

U: The analyte was analyzed for but not detected. The associated numerical value is the SQL.

UJK: The analyte was analyzed for but not detected. The associated numerical value is the SQL. The analyte was positively identified. The associated numerical result is an estimate. Unknown bias.

SECTION 6

POTENTIAL SOURCES

Three potential source areas were identified by START-2 personnel for further investigation. Source areas at the Gold Hill and Iowa Mines site include two tailing piles at Gold Hill Mine, three waste rock piles (evaluated as one pile) at Iowa Mine, and the former Gold Hill Mine mill location. Photographic documentation is provided in Appendix A. Table 6-1 presents a summary of analytes detected at each potential source location. The analytical results for the potential source samples collected are presented below.

6.1 WASTE PILES

6.1.1 Sample Location

START-2 personnel collected four surface soil samples from the two waste tailings piles at the Gold Hill Mine site and one surface soil sample from the three waste rock piles at the Iowa Mine site. The location of these surface soil samples are shown on Figures 3-1 and 3-2.

- **Gold Hill Mine Tailings Piles** – Surface soil sample GHM-SS-SR004-0003, collected from Gold Hill Mine Waste Pile #1, is described as light brown, silty sand, and damp. Surface soil sample GHM-SS-SR005-0003, collected from Gold Hill Mine Waste Pile #1, is described as light brown, silty sand, and damp. Surface soil sample GHM-SS-SR001-003, collected from Gold Hill Mine Waste Pile #2, is described as light brown, silty sand, and damp. Surface soil sample GHM-SS-SR002-0003, collected from Gold Hill Mine Waste Pile #2, is described as light brown, silty, gravelly sand, and damp.

- **Iowa Mine Waste Rock Piles** – Surface soil sample GHM-SS-SR006-0003, collected from the Iowa Mine waste rock piles, is described as light brown, silty sand, and damp.

6.1.2 Sample Results

Analytical results for surface soil samples are shown in Table 6-1, as summarized below:

- **Gold Hill Mine Tailings Piles** – Sample GHM-SS-SR004-0003 from Gold Hill Mine Waste Pile #1 contained significant concentrations of arsenic, copper, lead, mercury, and silver. Sample GHM-SS-SR005-0003 from Gold Hill Mine Waste Pile #1 contained significant concentrations of arsenic, copper, lead, mercury, and silver. Sample GHM-SS-SR001-0003 from Gold Hill Mine Waste Pile #2 contained significant concentrations of arsenic, copper, lead, mercury, and silver. Sample GHM-SS-SR002-0003 from Gold Hill Mine Waste Pile #2 contained significant concentrations of arsenic, copper, lead, mercury, and silver.

- **Iowa Mine Waste Rock Piles** – Sample GHM-SS-SR006-0003 from Iowa Mine Waste Rock piles contained significant concentrations of arsenic, lead, and silver.

6.2 MILL LOCATION

6.2.1 Sample Location

START-2 personnel collected one surface soil sample at the former Gold Hill Mine mill location. The location of this surface soil sample is shown on Figures 3-1 and 3-2.

- **Gold Hill Mine Mill Location** – Surface soil sample GHM-SS-SD003-0003, collected from the former Gold Hill Mine mill location, is described as light brown, silty sand with gravel.

6.2.2 Sample Results

Analytical results for surface soil samples are shown in Table 6-1, as summarized below:

- **Gold Hill Mine Mill Location** – Sample GHM-SS-SR003-0003 from Gold Hill Mine former mill location contained significant concentrations of arsenic, cadmium, chromium, copper, lead, manganese, mercury, silver, vanadium, and zinc.

Table 6-1—Results Summary for Source Soil Sample
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Description	IDEQ Initial Default Target Levels for Soil[1]	EPA Region 9 PRGs[2]	Background Surface Soil	Mine Waste Soil					
START-2 Sample Number			GHM-SS-BG001-0003	GHM-SS-SR001-0003	GHM-SS-SR002-0003	GHM-SS-SR003-0003	GHM-SS-SR004-0003	GHM-SS-SR005-0003	GHM-SS-SR006-0003
EPA Sample Number			05454272	05454274	05454275	05454276	05454277	05454278	05454279
CLP Sample Number			MJ6A11	MJ6A13	MJ6A14	MJ6A15	MJ6A16	MJ6A17	MJ6A18
Location			Unnamed Tributary to Granite Creek	Gold Hill Mine Waste Pile #2	Gold Hill Mine Waste Pile #2	Gold Hill Mine Mill Location	Gold Hill Mine Waste Pile #1	Gold Hill Mine Waste Pile #1	Iowa Mine Waste Pile
Metals (mg/kg)									
Aluminum	NA	76000	**2550**	**653**	**529**	**4690**	**965**	**500**	**791**
Antimony	4.77	31	7.8 UJK	1.1 BJK	2.8 BJK	2.0 BJK	2.7 BJK	1.4 BJK	6.8 U
Arsenic	0.391	0.39	0.70 BJK SQL=1.3	**112**	**120**	**57.3**	**118**	**94.3**	**46.1**
Barium	896	5400	**68.1**	**46.9**	**51.7**	**67.8**	**51.5**	**28.5**	**27.0**
Beryllium	1.63	1500	0.13 BJK SQL=0.65	0.55 U	0.57 U	0.53 BJK	0.58 U	0.57 U	0.57 U
Cadmium	1.35	37	0.65 U	0.17 BJK	0.25 BJK	**3.6**	0.33 BJK	0.12 BJK	0.12 BJK
Calcium	NA	NA	**782**	209 BJK	241 BJK	**973**	528 BJK	267 BJK	359 BJK
Chromium	2130	210	**2.2**	1.1 U	0.26 BJK	**10.7**	**1.5**	0.31 BJK	0.29 BJK
Cobalt	NA	900	1.5 BJK SQL=6.49	0.23 UJK	0.30 UJK	5.6 BJK	0.48 UJK	0.42 UJK	5.7 U
Copper	921	3100	1.4 BJK SQL=3.25	**5.5**	**10.7**	**29.1**	**18.7**	**7.7**	2.4 BJK
Iron	5.76	23000	**5350 JK**	**8790 JK**	**21800 JK**	**33200 JK**	**17100 JK**	**10000 JK**	**4440 JK**
Lead	49.6	400	**2.6**	**209**	**411**	**155**	**128**	**199**	**125**
Magnesium	NA	NA	**759**	197 BJK	102 BJK	**2010**	277 BJK	85.0 BJK	103 BJK
Manganese	223	1800	**118 JH**	**15.0 JH**	**14.0 JH**	**416 JH**	**73.0 JH**	**18.3 JH**	1.9 UJK
Mercury	0.00509	23	0.13 U	**0.16**	**0.64**	**0.85**	**2.6**	**0.14**	0.12 U
Nickel	59.1	NA	0.94 UJK	0.16 UJK	0.24 UJK	3.1 UJK	0.74 UJK	0.25 UJK	0.22 UJK
Potassium	NA	NA	**660**	**412** BJK	**773**	485 BJK	390 BJK	383 BJK	**644**
Selenium	2.03	390	4.5 U	0.43 UJK	1.3 UJK	4.0 U	4.1 U	0.43 UJK	0.61 UJK
Silver	0.189	390	1.3 U	**7.3**	**9.5**	**1.7**	**2.0**	**4.3**	**1.7**
Sodium	NA	NA	83.2 BJK	93.6 BJK	170 BJK	73.9 BJK	131 BJK	65.6 BJK	73.1 BJK
Thallium	1.55	5.2	3.2 UJK	2.8 UJK	2.7 BJL	1.3 BJL	2.4 BJL	1.5 BJL	0.89 BJL
Vanadium	NA	550	3.9 BJK SQL=6.49	0.92 BJK	2.3 BJK	**10.8**	2.7 BJK	0.41 BJK	**0.43**
Zinc	886	23000	**31.3 JK**	**32.3 JK**	**52.9 JK**	**738 JK**	**60.3 JK**	**45.1 JK**	**12.0 JK**

Notes:

[1] Idaho Department of Environmental Quality (IDEQ) residential values .

[2] EPA Region 9 Preliminary Remedial Goals (PRGs) for residential soil direct contact exposure pathway.

Bold type indicates the sample concentration is above its SQL.

Bold underlined type indicates a sample concentration that is significantly above background as defined in Section 5.

CLP: Contract Laboratory Program.

BJK: The analyte was positively identified. The associated numerical result is an estimate because the concentration is below the Contract Required Quantitation Limit. Unknown bias.

BJL: The analyte was positively identified. The associated numerical result is an estimate because the concentration is below the Contract Required Quantitation Limit. Low bias.

JH: The analyte was positively identified. The associated numerical result is an estimate. High bias.

JK: The analyte was positively identified. The associated numerical result is an estimate. Unknown bias.

mg/kg: milligrams per kilogram.

NA: Not Available.

SQL: Sample Quantitation Limit.

UJK: The analyte was analyzed for but not detected. The associated numerical value is the SQL. The analyte was positively identified. The associated numerical result is an estimate. Unknown bias.

U: The analyte was analyzed for but not detected. The associated numerical value is the SQL.

SECTION 7

MIGRATION/EXPOSURE PATHWAYS AND TARGETS

7.1 GROUNDWATER MIGRATION PATHWAY

Groundwater at the mine sites is expected to follow faults and brecciated zones within the country rock. The hydraulic conductivity of the bedrock unit is assumed to be approximately 10^{-8} centimeters per second (cm/s). Depth to groundwater at the mines site is unknown but is anticipated to be relatively deep within the bedrock. The mean annual precipitation is 23.49 inches recorded at the Idaho City, located 15 miles to the southeast (WRCC 2005a). Groundwater within the 4-mile Target Distance Limit (TDL) is not used for irrigation and livestock watering, and no wellhead protection areas are present. A 4-mile TDL map is provided on Figure 7-1.

7.1.1 Targets

The primary targets for the groundwater migration pathway are the private wells within the 4-mile TDL that use groundwater for domestic uses or for irrigation or industrial purposes. According Idaho Department of Water Resources Records, there are 81 private drinking water wells located within the groundwater migration pathway's 4-mile TDL. No public drinking water systems are located within the 4-mile TDL (IDEQ 2004).

The nearest well designated for domestic use consists of one private well located approximately 1.5 miles from the site. Based on the average number of people per household in the county (2.52; United States Census Bureau 2005), and the estimated population served by the private wells, the number of people served by groundwater within the 4-mile TDL is 204. The number of wells and their associated population (organized by distance rings) are provided in Table 7-1.

7.1.2 Sample Locations

No groundwater pathway samples were collected from the Gold Hill and Iowa Mines site.

7.1.3 Sample Results

No groundwater pathway samples were collected from the Gold Hill and Iowa Mines site.

7.2 SURFACE WATER MIGRATION PATHWAY

The following sections presents the findings obtained for the surface water pathway during the PA/SI, including surface water pathway description, sample locations, and analytical results for samples collected from the PPEs and in-water segment of the surface water pathway. Sampling locations are presented in Figures 3-1 and 3-2. The 15-mile surface water pathway TDL is presented in Figure 7-2. Table 7-2 presents the analytical results for the samples collected and a comparison to background concentrations.

7.2.1 Surface Water Pathway Description

Surface water runoff from the site flows overland and enters Granite Creek at three distinct PPEs. Surface water flows from the waste rock piles at Iowa Mine approximately 50 feet and enters Granite Creek at PPE 1. Surface water flows from Gold Hill Mine Waste Pile #1 approximately 300 feet and enters Granite Creek at PPE 2. Surface water flows from Gold Hill Mine Waste Pile #2 approximately 300 feet and enters Granite Creek at PPE 3. Surface water then flows approximately 3 miles down Granite Creek to the confluence with Grimes Creek. From the confluence with Grimes Creek, the 15-mile TDL continues an additional 12 miles along Grimes Creek and extends to approximately 0.5 mile downstream of the confluence of Wild Goat Creek with Grimes Creek. The total distance for the TDL is approximately 15.5 miles from PPE 1. A 15-mile TDL map is provided on Figure 7-2.

According to information from a gauging station on Grimes Creek, flow measured on September 24, 2003 was 12.6 cubic feet per second (USGS 2005). During the site visit Granite Creek was estimated to have a flow of 5 to 10 cubic feet per second. Surface soil types in the vicinity of the mines have not been investigated or mapped by the Natural Resource Conservation Service. The 2-year, 24-hour rainfall in the site vicinity is 1.8 inches (WRCC 2005b). The mine site is not located on a floodplain (FEMA 2005). There are 14 points of surface water diversion located within the 15-mile TDL (IDWR 2005). The uses for each diversion were not determined but are expected to be for watering livestock and mining (IDEQ 2004).

7.2.2 Targets

Fishing is allowed in Granite and Grimes Creeks. The primary game fish is rainbow trout, which are stocked, and brook trout. Creel surveys were not identified but it is estimated that the take in the whole of Grimes Creek is 1,000 lb annually (IDFG 2005).

Wetland frontage along the 15-mile TDL was not estimated because wetlands in the vicinity of the mine sites have not been mapped. Sensitive environments related to threatened or endangered terrestrial and marine species were identified within the 15-mile TDL (USFS 2005) as follows:

- Habitat for the Gray Wolf (*Canis lupus*), a federally-listed threatened species.
- Habitat for the Bald Eagle *(Haliaeetus leucocephalus)*, a federal- and state-listed threatened species.

7.2.3 Sample Locations

START-2 personnel collected four PPE sediment samples and 18 sediment samples from surface water drainages at the Gold Hill and Iowa Mines site. The location of these sediment samples are shown on Figures 3-1 and 3-2. A summary of the sediment samples collected are as follows:

- **PPE Sediment Samples** – Sediment sample GHM-SD-SD022-0001, collected from within Granite Creek at the Iowa Mine waste piles (PPE 1), is described as gray, medium to coarse sand, wet without cobbles. Sediment sample GHM-SD-SD020-0003, collected from within Granite Creek at the toe of Gold Hill Waste Pile #1 (PPE 2), is described as

gray/brown, medium to coarse sand, wet with limited fines. Sediment sample GHM-SD-SD018-0001 (dredge sample), collected from within Granite Creek at the toe of the Gold Hill Mine Waste Pile #2 (PPE 3), is described as gray/brown, fine to coarse sand, wet with some fines and tailings. Sediment sample GHM-SD-SD019-0001, collected from within Granite Creek at the toe of the Gold Hill Mine Waste Pile #2 (PPE 3)(co-located with sample GHM-SD-SD018-0001), is described as gray/brown, fine to coarse sand, wet with some fines and tailings.

- **Mores Creek** – Sediment sample GHM-SD-SD001-0003 (attribution sample) (dredge sample), collected from within Mores Creek, is described as brown, medium to coarse sand. Sediment sample GHM-SD-SD002-0003 (attribution sample), collected from within Mores Creek (co-located with sample GHM-SD-SD001-0003), is described as brown, medium to coarse sand. Sediment sample GHM-SD-SD003-0001 (attribution sample), collected from within Mores Creek, is described as gray/brown, medium to coarse sand with gravel, cobbles, and boulders within stream bed.

- **Grimes Creek** – Sediment sample GHM-SD-SD004-0001, collected from within Grimes Creek, is described as gray/brown, medium to coarse sand, wet with gray cobbles and boulders within stream bed. Sediment sample GHM-SD-SD005-0001, collected from within Grimes Creek, is described as gray/brown, medium to coarse sand, wet with cobbles and boulders within stream bed. Sediment sample GHM-SD-SD006-0001, collected from within Grimes Creek, is described as gray/brown, medium to coarse sand, wet with gray cobbles and boulders within stream bed. Sediment sample GHM-SD-SD007-0001 (dredge sample), collected from within Grimes Creek, is described as gray/brown, medium to coarse sand, wet with cobbles in stream bed. Sediment sample GHM-SD-SD008-0001, collected from within Grimes Creek (co-located with sample GHM-SD-SD007-0001), is described as gray/brown, medium to coarse sand, wet with cobbles in stream bed. Sediment sample GHM-SD-SD009-0005, collected from within Grimes Creek (co-located with sample GHM-SD-SD007-0001), is described as tailings, gray/brown gravelly sand with cobbles in stream bed. Sediment sample GHM-SD-SD010-0003, collected from within Grimes Creek, is described as gray/brown, medium to coarse sand, wet with cobbles in stream bed.

- **Granite Creek** – Sediment sample GHM-SD-SD011-0002, collected from within Granite Creek, is described as gray/brown, medium to coarse sand, wet. Sediment sample GHM-SD-SD012-0002, collected from within Granite Creek, is described as gray/brown, medium to coarse sand, wet. Sediment sample GHM-SD-SD013-0001 (dredge sample), collected from within Granite Creek, is described as gray/brown, medium to coarse sand, wet with cobbles in stream bed. Sediment sample GHM-SD-SD014-0001, collected from within Granite Creek (co-located with sample GHM-SD-SD013-0001), is not described on the field forms. Sediment sample GHM-SD-SD015-0003, collected from within Granite Creek (co-located with sample GHM-SD-SD013-0001), is described as gray, sandy gravel, damp with cobbles and tailings. Sediment sample GHM-SD-SD016-0001, collected from within Granite Creek, is described as medium brown, medium to coarse sand with some cobbles. Sediment sample GHM-SD-

SD017-0001, collected from within Granite Creek, is described as gray/brown, medium to coarse sand with cobbles.

- **Confederate Gulch** – Sediment sample GHM-SD-SD021-0003 (attribution sample), collected from within Confederate Gulch, is described as gray/brown, medium to coarse sand, wet without cobbles.

7.2.4 Sample Results

Analytical results for the sediment samples are shown in Table 7-2, as summarized below:

- **PPE Sediment Samples** – Sediment sample GHM-SD-SD022-0001 from PPE 1 contained significant concentrations of arsenic, mercury and nickel. Sediment sample GHM-SD-SD020-0003 from PPE 2 contained significant concentrations of arsenic. Sediment sample GHM-SD-SD018-0001 (dredge sample) from PPE 3 contained significant concentrations of arsenic, lead and mercury. Sediment sample GHM-SD-SD019-0001, from PPE 3 (co-located with sample GHM-SD-SD018-0001) contained significant concentrations of arsenic, cadmium, lead, and mercury.

- **Mores Creek** – The sediment samples collected from Mores Creek (GHM-SD-SD001-0003, GHM-SD-SD002-0003, GHM-SD-SD001-0003, and GHM-SD-SD003-0001) contained no significant concentrations.

- **Grimes Creek** – The sediment samples collected from Grimes Creek (GHM-SD-SD004-0001, GHM-SD-SD005-0001, GHM-SD-SD006-0001, GHM-SD-SD007-0001, GHM-SD-SD008-0001, GHM-SD-SD009-0005, and GHM-SD-SD010-0003) contained no significant concentrations.

- **Granite Creek** – Sediment sample GHM-SD-SD015-0003 from Granite Creek (co-located with sample GHM-SD-SD013-0001) contained significant concentrations of cobalt and nickel. Sediment sample GHM-SD-SD017-0001 from Granite Creek contained significant concentrations of arsenic, cadmium, manganese, and mercury. The remaining three samples collected from Granite Creek (GHM-SD-SD011-0002, GHM-SD-SD012-0002, GHM-SD-SD013-0001, GHM-SD-SD014-0001, and GHM-SD-SD016-0001) contained no significant concentrations.

- **Confederate Gulch** – Sediment sample GHM-SD-SD021-0003 (attribution sample) from Confederate Gulch contained no significant concentrations.

7.3 SOIL EXPOSURE PATHWAY

7.3.1 Targets

No residences, schools, daycares, or workers are known to be present on the mine sites nor located within 200 feet of potential sources (EPA 2005). In addition, there are no schools located within 1 mile of the mine sites. No resident population exists within 1 mile of the mine

sites (MCDC 2005). No commercial agriculture, commercial livestock production, or grazing are known to occur at the mine sites. The majority of the potential source areas are only slightly accessible to the public. No habitat for federal- and state-listed threatened or endangered species was identified on potential source areas at the mine sites (ICDC 2005).

7.3.2 Sample Locations

No soil exposure pathway samples were collected from the Gold Hill and Iowa Mines site.

7.3.3 Sample Results

No soil exposure pathway samples were collected from the Gold Hill and Iowa Mines site.

7.4 AIR MIGRATION PATHWAY

7.4.1 Targets

There is a potential for releases to air at the mine sites stem from the potential to release by particulate migration. No known air releases have occurred. A total population of 186 is estimated within the 4-mile TDL (Table 7-3).

The area of wetlands within the 4-mile TDL was not estimated because the wetlands have not been mapped. Sensitive environments related to threatened or endangered terrestrial and marine species that are present within the 4-miles TDL (ICDC 2005) are as follows:

- Habitat for the Gray Wolf (*Canis lupus*), a federally-listed threatened species.
- Habitat for the Bald Eagle *(Haliaeetus leucocephalus)*, a federal- and state-listed threatened species.

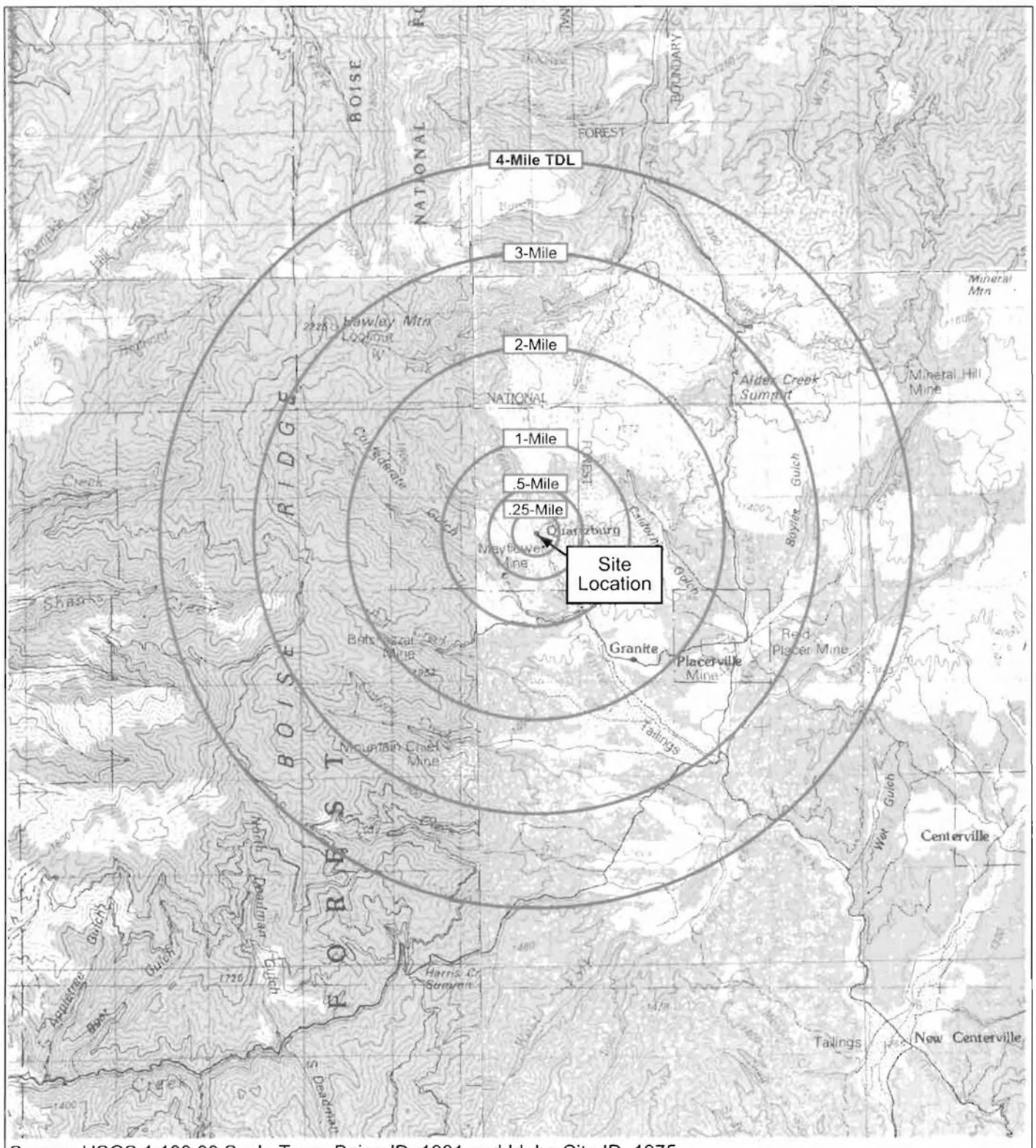
The Boise National Forest is located within 0.5 miles of the site. It is used as a designated recreation area and for silviculture.

7.4.2 Sample Locations

No air migration pathway samples were collected from the Gold Hill and Iowa Mines site.

7.4.3 Sample Results

No air migration pathway samples were collected from the Gold Hill and Iowa Mines site.



Source: USGS 1:100,00 Scale Topo, Boise-ID, 1981 and Idaho City-ID, 1975.

4-Mile Target Distance Limit (TDL) Map
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

0 0.75 1.5

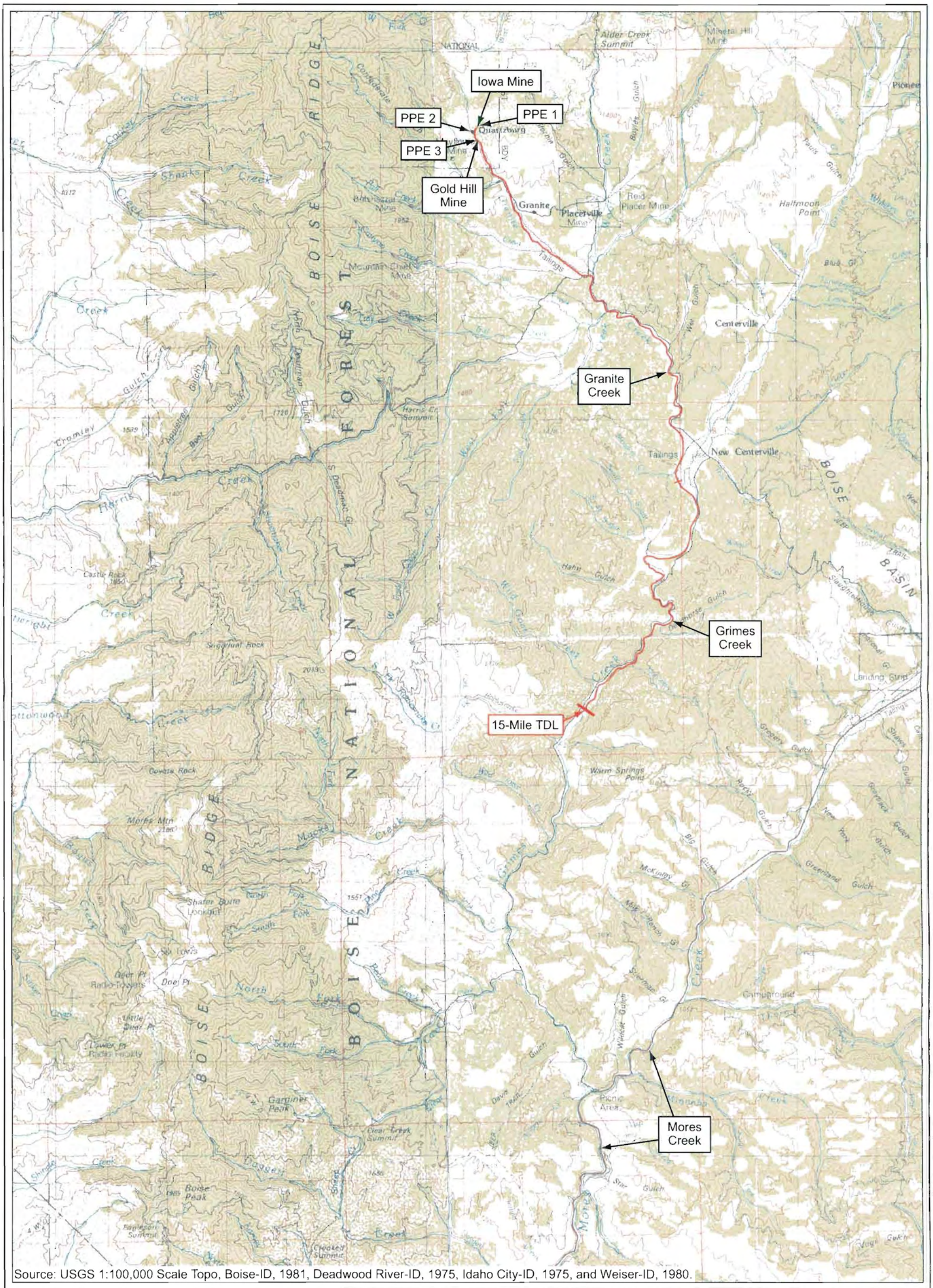
Scale in Miles

WESTON SOLUTIONS

Figure

7-1

06-0018 Fig7-1.ai



Source: USGS 1:100,000 Scale Topo, Boise-ID, 1981, Deadwood River-ID, 1975, Idaho City-ID, 1975, and Weiser-ID, 1980.

15-Mile Target Distance Limit (TDL) Map
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Figure
7-2

WESTON SOLUTIONS

06-0018 Fig7-2.ai

Table 7-1—Drinking Water Population Within the 4-Mile TDL
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Distance (Miles)	Private Drinking Water Wells	Population Served by Private Drinking Water Wells*
0-0.25	0	0
0.25-0.5	0	0
0.5-1	0	0
1-2	11	28
2-3	29	73
3-4	41	103
Total	**81**	**204**

Source: IDWR (Idaho Department of Water Resources) 2005.

United States Census Bureau—Average household size in Boise County, Idaho is 2.52.

* Population data was estimated from information on drinking water wells in the area and the average number of people per household in Boise County.

Table 7-2—Results Summary Sediment Samples
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Description	IDEQ Initial Default Target Levels for Soil[1]	EPA Region 9 PRGs[2]	Background Sediment	Stream Sediment									
START-2 Sample Number			GHM-SD-BG002-0004	GHM-SD-SD001-0003	GHM-SD-SD002-0003	GHM-SD-SD003-0001	GHM-SD-SD004-0001	GHM-SD-SD005-0001	GHM-SD-SD006-0001	GHM-SD-SD007-0001	GHM-SD-SD008-0001	GHM-SD-SD009-0005	GHM-SD-SD010-0003	GHM-SD-SD011-0002
EPA Sample Number			05454273	05454250	05454251	05454252	05454253	05454254	05454255	05454256	05454257	05454258	05454259	05454260
CLP Sample Number			MJ6A12	MJ69Y9	MJ69Z0	MJ69Z1	MJ69Z2	MJ69Z3	MJ69Z4	MJ69Z5	MJ69Z6	MJ69Z7	MJ69Z8	MJ69Z9
Location			Granite Creek Upgradient of Mines	Attribution—Mores Creek (Dredge Sample)	Attribution—Mores Creek	Attribution—Mores Creek	Grimes Creek	Grimes Creek	Grimes Creek	Grimes Creek (Dredge Sample)	Grimes Creek	Grimes Creek (Tailings)	Grimes Creek	Grimes Creek
Metals (mg/kg)														
Aluminum	NA	76000	**6750**	**1030**	**1170**	**1160**	**1230**	**1480**	**1310**	**958**	**1090**	**2980**	**1640**	**1030**
Antimony	4.77	31	7.2 U	7.9 U	7.9 U	7.6 U	7.7 U	7.5 U	8.0 U	7.8 U	7.8 U	6.5 U	8.0 U	7.8 U
Arsenic	0.391	0.39	**3.5**	**5.0**	**7.0**	**10.0**	**6.8**	**2.8**	**3.2**	**2.8**	**3.5**	**3.2**	**8.8**	**2.8**
Barium	896	5400	**164**	22.7 BJK	26.0 BJK	23.1 BJK	**26.1**	**28.3**	**28.7**	**26.2**	**28.0**	**56.7**	**32.5**	22.6 BJK
Beryllium	1.63	1500	0.38 BJK SQL=0.6	0.08 BJK	0.13 BJK	0.10 BJK	0.10 BJK	0.10 BJK	0.10 BJK	0.21 BJK	0.14 BJK	0.20 BJK	0.13 BJK	0.08 BJK
Cadmium	1.35	37	0.28 BJK SQL=0.6	0.13 BJK	0.15 BJK	0.63 U	0.14 BJK	0.14 BJK	0.67 U	0.14 BJK	0.21 BJK	0.16 BJK	0.20 BJK	0.65 U
Calcium	NA	NA	**1220**	597 BJK	**839**	**705**	506 BJK	**679**	568 BJK	514 BJK	546 BJK	**897**	613 BJK	530 BJK
Chromium	2130	210	**5.3**	**1.9**	**1.7**	**2.1**	**1.5**	**2.0**	**1.6**	**1.7**	**2.0**	**3.0**	**2.4**	**2.9**
Cobalt	NA	900	4.2 BJK SQL=3	1.5 BJK	1.6 BJK	1.7 BJK	1.7 BJK	1.7 BJK	1.8 BJK	1.4 BJK	2.0 BJK	2.5 BJK	1.9 BJK	1.5 BJK
Copper	921	3100	**4.5**	2.7 BJK	**9.7**	**3.4**	2.4 BJK	**3.5**	2.5 BJK	**10.5**	2.7 BJK	**7.0**	**5.4**	3.0 BJK
Iron	5.76	23000	**10300 JK**	**2800**	**3540**	**4660**	**3440**	**3760**	**3960**	**2920**	**3690**	**6030**	**5050**	**3310**
Lead	49.6	400	**7.1**	**2.2**	**4.5**	**3.2**	**1.9**	**2.9**	**2.6**	**2.1**	**2.5**	**11.8**	**6.6**	0.85 BJK
Magnesium	NA	NA	**1500**	456 BJK	599 BJK	**665**	446 BJK	584 BJK	468 BJK	350 BJK	375 BJK	**962**	669 BJK	406 BJK
Manganese	223	1800	**412 JH**	**226**	**211**	**220**	**208**	**199**	**185**	**238**	**237**	**157**	**198**	**151**
Mercury	0.00509	23	0.12 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.12 U	0.11 U	0.13 U	0.13 U
Nickel	59.1	NA	2.9 UJK	1.2 UJK	1.1 BJK	1.8 BJK	0.95 UJK	0.95 UJK	1.0 UJK	0.74 UJK	1.3 UJK	1.8 UJK	1.0 UJK	1.0 UJK
Potassium	NA	NA	**1710**	287 BJK	318 BJK	301 BJK	361 BJK	412 BJK	348 BJK	213 BJK	257 BJK	**837**	422 BJK	206 BJK
Selenium	2.03	390	0.91 UJK	0.66 BJK	1.2 BJK	4.4 U	0.53 BJK	4.4 U	4.7 U	4.5 U	4.5 U	0.46 BJK	4.7 U	4.5 U
Silver	0.189	390	1.2 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.1 U	1.3 U	1.3 U
Sodium	NA	NA	81.0 BJK	58.6 BJK	62.4 BJK	104 BJK	58.1 BJK	60.8 BJK	80.2 BJK	45.2 BJK	51.4 BJK	73.7 BJK	65.5 BJK	69.7 BJK
Thallium	1.55	5.2	3.0 UJK	3.3 U	3.3 U	3.2 U	3.2 U	3.1 U	3.3 U	3.2 U	3.2 U	2.7 U	3.3 U	3.2 U
Vanadium	NA	550	**12.4**	2.5 BJK	3.7 BJK	3.3 BJK	3.3 BJK	3.8 BJK	3.7 BJK	3.1 BJK	4.4 BJK	**6.9**	4.7 BJK	4.2 BJK
Zinc	886	23000	**63.6 JK**	**22.4**	**25.6**	**27.7**	**32.9**	**37.1**	**33.1**	**28.8**	**28.9**	**35.8**	**42.3**	**31.9**

Notes:

[1] Initial IDEQ Target Levels for Soil were used due to the lack of sediment values for comparison.

[2] EPA Region 9 Preliminary Remedial Goals (PRGs) for residential soil direct contact exposure pathway.

Bold type indicates the sample concentration is above its SQL.

Bold underlined type indicates a sample concentration that is significantly above background as defined in Section 5.

BJK: The analyte was positively identified. The associated numerical result is an estimate because the concentration is below the Contract Required Quantitation Limit. Unknown bias.

CLP: Contract Laboratory Program.

JH: The analyte was positively identified. The associated numerical result is an estimate. High bias.

JK: The analyte was positively identified. The associated numerical result is an estimate. Unknown bias.

mg/kg: milligrams per kilogram.

NA: Not Available.

SQL: Sample Quantitation Limit.

U: The analyte was analyzed for but not detected. The associated numerical value is the SQL.

UJK: The analyte was analyzed for but not detected. The associated numerical value is the SQL. The analyte was positively identified. The associated numerical result is an estimate. Unknown bias.

Table 7-2—Results Summary Sediment Samples
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Description	IDEQ Initial Default Target Levels for Soil[1]	EPA Region 9 PRGs[2]	Background Sediment	Stream Sediment									
Weston Sample Number			GHM-SD-BG002-0004	GHM-SD-SD012-0002	GHM-SD-SD013-0001	GHM-SD-SD014-0001	GHM-SD-SD015-0003	GHM-SD-SD016-0001	GHM-SD-SD017-0001	GHM-SD-SD018-0001	GHM-SD-SD019-0001	GHM-SD-SD020-0003	GHM-SD-SD021-0003	GHM-SD-SD022-0001
EPA Sample Number			05454273	05454261	05454262	05454263	05454264	05454265	05454266	05454267	05454268	05454269	05454270	05454271
CLP Sample Number			MJ6A12	MJ6A00	MJ6A01	MJ6A02	MJ6A03	MJ6A04	MJ6A05	MJ6A06	MJ6A07	MJ6A08	MJ6A09	MJ6A10
Location			Granite Creek Upgradient of Mines	Grimes Creek	Grimes Creek (Dredge Sample)	Grimes Creek	Grimes Creek (Tailings)	Granite Creek	Granite Creek	PPE # 3 Toe of Waste Pile #2—Granite Creek (Dredge Sample)	PPE # 3 Toe of Waste Pile #2—Granite Creek	PPE # 2 Toe of Waste Pile #1—Granite Creek	Attribution—Confederate Gulch	PPE # 1 Iowa Mine Waste Pile—Granite Creek
Metals (mg/kg)														
Aluminum	NA	76000	**6750**	**2290**	**2290**	**3080**	**6340**	**2520**	**2220**	**3260**	**2980**	**2510**	**2020**	**4000**
Antimony	4.77	31	7.2 U	7.8 U	8.0 U	7.8 U	6.5 U	7.7 U	7.7 U	8.0 U	8.4 U	8.0 U	7.9 U	8.0 U
Arsenic	0.391	0.39	**3.5**	**2.7**	**3.1**	**1.7**	**3.4**	**3.1**	**21.5**	**76.5**	**69.4**	**12.0**	**1.8**	**11.1**
Barium	896	5400	**164**	**46.7**	**56.6**	**61.5**	**108**	**56.5**	**77.2**	**78.9**	**97.9**	**59.2**	**43.1**	**45.8**
Beryllium	1.63	1500	0.38 BJK SQL=0.6	0.10 BJK	0.10 BJK	0.12 BJK	0.29 BJK	0.10 BJK	0.19 BJK	0.17 BJK	0.19 BJK	0.13 BJK	0.11 BJK	0.13 BJK
Cadmium	1.35	37	0.28 BJK SQL=0.6	0.65 U	0.26 BJK	0.22 BJK	0.38 BJK	0.21 BJK	**0.70**	0.65 BJK	**0.83**	0.27 BJK	0.22 BJK	0.25 BJK
Calcium	NA	NA	**1220**	**946**	**973**	**1280**	**2650**	**1010**	**824**	**1180**	**1560**	**1020**	629 BJK	**814**
Chromium	2130	210	**5.3**	**2.0**	**1.9**	**2.2**	**14.8**	**2.3**	**3.5**	**7.9**	**2.2**	**1.5**	0.99 BJK	**13.1**
Cobalt	NA	900	4.2 BJK SQL=3	2.8 BJK	3.4 BJK	2.8 BJK	**8.0**	2.5 BJK	4.3 BJK	2.8 BJK	3.1 BJK	1.8 BJK	1.3 BJK	3.2 BJK
Copper	921	3100	**4.5**	**4.5**	**4.5**	1.8 BJK	**13.5**	2.2 BJK	**6.2**	**4.5**	**4.2**	2.2 BJK	1.7 BJK	**3.7**
Iron	5.76	23000	**10300 JK**	**5690**	**6870**	**6800**	**15700**	**7640**	**9760**	**17100**	**22400**	**11800**	**5200 JK**	**9570 JK**
Lead	49.6	400	**7.1**	**1.6**	**2.6**	0.65 BJK	**3.4**	1.3 BJK	**13.5**	**24.5**	**24.8**	**5.0**	**4.9**	**12.2**
Magnesium	NA	NA	**1500**	**1020**	**917**	**1290**	**4810**	**1080**	505 BJK	**1300**	**896**	**887**	**674**	**2060**
Manganese	223	1800	**412 JH**	**166**	**498**	**210**	**151**	**167**	**1260**	**886**	**972**	**483**	**62.6 JH**	**77.2 JH**
Mercury	0.00509	23	0.12 U	0.13 U	0.13 U	0.13 U	0.11 U	0.13 U	**0.22**	**0.16**	**0.15**	0.07 BJK	0.13 U	**0.33**
Nickel	59.1	NA	2.9 UJK	3.8 UJK	4.3 UJK	3.0 UJK	**20.5**	3.2 UJK	2.4 UJK	1.6 UJK	2.3 UJK	1.0 UJK	0.79 UJK	**6.0**
Potassium	NA	NA	**1710**	528 BJK	**670**	**1060**	**763**	**855**	274 BJK	**829**	**798**	**762**	594 BJK	**721**
Selenium	2.03	390	0.91 UJK	0.77 BJK	4.6 U	4.6 U	3.8 U	4.5 U	4.5 U	4.7 U	4.9 U	4.6 U	0.50 UJK	4.6 U
Silver	0.189	390	1.2 U	1.3 U	1.3 U	1.3 U	1.1 U	1.3 U	1.3 U	1.3 U	1.4 U	1.3 U	1.3 U	0.26 BJK
Sodium	NA	NA	81.0 BJK	93.5 BJK	112 BJK	106 BJK	289 BJK	113 BJK	60.1 BJK	93.8 BJK	79.3 BJK	76.5 BJK	60.9 BJK	82.8 BJK
Thallium	1.55	5.2	3.0 UJK	3.2 U	3.3 U	3.3 U	2.7 U	3.2 U	1.2 BJK	3.3 U	3.5 U	3.3 U	3.3 UJK	3.3 UJK
Vanadium	NA	550	**12.4**	6.4 BJK	**8.3**	**7.3**	**21.8**	**9.0**	4.4 BJK	5.9 BJK	5.9 BJK	4.9 BJK	3.6 BJK	**7.8**
Zinc	886	23000	**63.6 JK**	**43.9**	**53.1**	**55.6**	**66.3**	**51.2**	**176**	**151**	173	**67.3**	**49.3 JK**	**89.1 JK**

Notes:

[1] Initial IDEQ Target Levels for Soil were used due to the lack of sediment values for comparison.

[2] EPA Region 9 Preliminary Remedial Goals (PRGs) for residential soil direct contact exposure pathway.

Bold type indicates the sample concentration is above its SQL.

Bold underlined type indicates a sample concentration that is significantly above background as defined in Section 5.

BJK: The analyte was positively identified. The associated numerical result is an estimate because the concentration is below the Contract Required Quantitation Limit. Unknown bias.

CLP: Contract Laboratory Program.

JH: The analyte was positively identified. The associated numerical result is an estimate. High bias.

JK: The analyte was positively identified. The associated numerical result is an estimate. Unknown bias.

mg/kg: milligrams per kilogram.

NA: Not Available.

SQL: Sample Quantitation Limit.

U: The analyte was analyzed for but not detected. The associated numerical value is the SQL.

UJK: The analyte was analyzed for but not detected. The associated numerical value is the SQL. The analyte was positively identified. The associated numerical result is an estimate. Unknown bias.

Table 7-3—Population and Wetland Acreage Within a 4-Mile Radius
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

Distance (miles)	Residents	Wetland Acreage[1]
Onsite	0	0
0 to ¼	0	0
¼ to ½	0	0
½ to 1	0	0
1 to 2	31	0
2 to 3	125	0
3 to 4	30	0
Total	**186**	**0**

Notes:

[1] Wetland acreage has not been mapped in the report area.

Source: MCDC, 2005.

SECTION 8

SUMMARY AND CONCLUSIONS

The Gold Hill and Iowa Mines is an inactive gold mine and mill site located approximately 25 miles northwest of Boise, Idaho. The Gold Hill and Iowa Mines are located on patented and un-patented land within the mountainous Boise Basin Mining District. The mines are located within 1,500 feet of each other on Granite Creek near the former town of Quartzburg, Idaho. The PA/SI field-sampling event was conducted on November 8 through 10, 2005.

8.1 SOURCES

Source sampling at the Gold Hill and Iowa Mines site revealed arsenic, cadmium, chromium, copper, lead, manganese, mercury, silver, vanadium, and zinc at significant concentrations above background in one or more of the source samples collected.

Analytical results from the surface soil samples (GHM-SS-SR004-0003 and GHM-SS-SR005-0003) collected from Gold Hill Mine Waste Pile #1 indicated the presence of arsenic, copper, lead, mercury, and silver at significant concentrations above background in one or more of the samples collected.

Analytical results from the surface soils samples (GHM-SS-SR001-0003 and GHM-SS-SR002-0003) collected from Gold Hill Mine Waste Pile #2 indicated the presence of arsenic, copper, lead, mercury, and silver at significant concentrations above background in one or more of the samples collected.

Analytical results from the surface soil sample (GHM-SS-SR006-0003) collected from Iowa Mine Waste Rock piles indicated the presence of arsenic, lead, and silver at significant concentrations above background.

Analytical results from the surface soil sample (GHM-SS-SR003-0003) collected from Gold Hill Mine former mill location indicated the presence of arsenic, cadmium, chromium, copper, lead, manganese, mercury, silver, vanadium, and zinc at significant concentrations above background.

8.2 TARGETS

Analytical results from the target sediment sample (GHM-SD-SD022-0001) collected from PPE 1 contained arsenic, mercury and nickel at significant concentrations above background. Analytical results from the target sediment sample (GHM-SD-SD020-0003) collected from PPE 2 contained arsenic at significant concentrations above background. Analytical results from the target sediment samples (GHM-SD-SD018-0001 and GHM-SD-SD019-0001) collected from PPE 3 contained arsenic, cadmium, lead, and mercury at significant concentrations above background in one or more of the samples collected.

Analytical results from the target sediment samples (GHM-SD-SD004-0001, GHM-SD-SD005-0001, GHM-SD-SD006-0001, GHM-SD-SD007-0001, GHM-SD-SD008-0001, GHM-SD-SD009-0005, and GHM-SD-SD010-0003) collected from Grimes Creek contained no significant concentrations above background.

Analytical results from the target sediment samples (GHM-SD-SD011-0002, GHM-SD-SD012-0002, GHM-SD-SD013-0001, GHM-SD-SD014-0001, GHM-SD-SD016-0001) collected from Granite Creek contained no significant concentrations above background. Analytical results from the target sediment samples (GHM-SD-SD015-0003 and GHM-SD-SD017-0001) collected from Granite Creek contained arsenic, cadmium, cobalt, manganese, mercury, and nickel at significant concentrations above background in one or more of the samples collected.

- The primary targets for the groundwater migration pathway are the private wells within the 4-mile TDL that use groundwater for domestic uses or for irrigation or industrial purposes. According Idaho Department of Water Resources Records, there are 81 private drinking water wells located within the groundwater migration pathway's 4-mile TDL.

- No public drinking water systems are located within the 4-mile TDL (IDEQ 2004).

- The nearest well designated for domestic use consists of one private well located approximately 1.5 miles from the site. Based on the average number of people per household in the county (2.52; United States Census Bureau 2005), and the estimated population served by the private wells, the number of people served by groundwater within the 4-mile TDL is 204.

- Wetland frontage along the 15-mile TDL was not estimated because wetlands in the vicinity of the mine sites have not been mapped.

- One sensitive environment related to threatened or endangered terrestrial and marine species was identified within the 15-mile TDL (USFS 2005) as follows: Habitat for the Bald Eagle *(Haliaeetus leucocephalus)*, a federal- and state-listed threatened species.

- No residences, schools, daycares, or workers are known to be present on the mine sites nor located within 200 feet of potential sources (EPA 2005).

- No schools located are within 1 mile of the mine sites.

- No resident population exists within 1 mile of the mine sites (MCDC 2005).

- No commercial agriculture, commercial livestock production, or grazing are known to occur at the mine sites.

- The majority of the potential source areas are only slightly accessible to the public due to a locked gate on the access road.

- No habitat for federal- and state-listed threatened or endangered species was identified on potential source areas at the mine sites (ICDC 2005).

- The potential for air emissions at the mine sites stems from the potential to release by particulate migration. No known air releases have occurred. A total population of 186 persons lives within the 4-mile TDL (Table 7-3).

- Sensitive environments related to threatened or endangered terrestrial and marine species that are present within the 4-mile TDL (ICDC 2005) are as follows: Habitat for the Gray Wolf (*Canis lupus*), a federally-listed threatened species, and habitat for the Bald Eagle *(Haliaeetus leucocephalus)*, a federal- and state-listed threatened species.

- The Boise National Forest is located within 0.5 miles of the site. It is used as a designated recreation area and for silviculture.

8.3 CONCLUSION

Based on human health and ecological targets identified during the PA/SI, it has been determined that the surface water is the only significant migration pathway at the Gold Hill and Iowa Mines site. The groundwater, soil exposure, and air migration pathways would not significantly contribute to the site HRS score, due to lack of targets associated with these pathways.

SECTION 9

REFERENCES

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USGS (United States Geological Survey). 2005. Streamflow data for Grimes Creek obtained at http://pubs.usgs.gov/wdr. October.

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APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

photo 1

START-2 personnel collecting GHM-SD-SD001-0003 with 2" dredge.

photo 2

Sediment samples GHM-SD-SD001-0003 and GHM-SD-SD002-0003.

Photolog

WESTON SOLUTIONS

06-0018 Photolog.ai

photo 3

Sediment sample GHM-SD-SD003-0001.

photo 4

Location for GHM-SD-SD007-0001, GHM-SD-SD008-0001, and GHM-SD-SD009-0005. Looking north toward a tailings pile in the background.

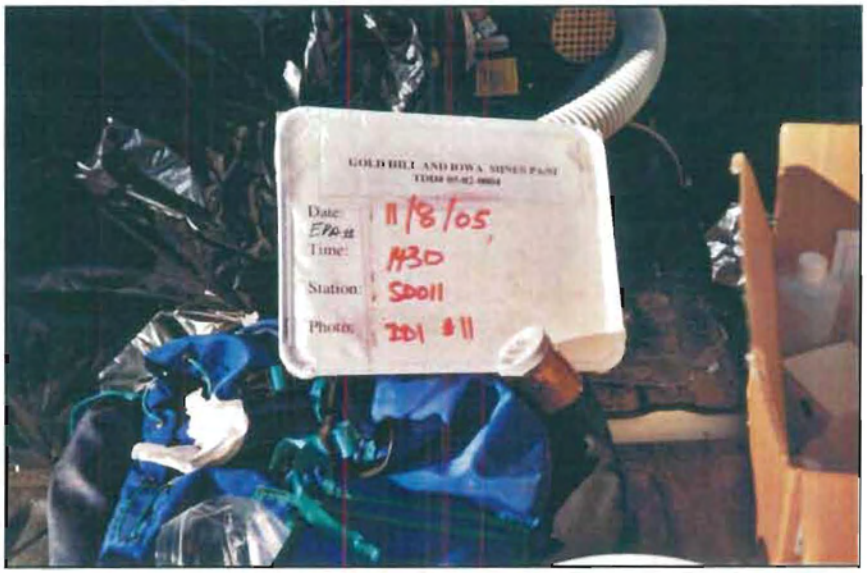
Photolog

06-0018 Photolog.ai

photo 5

START-2 personnel collecting GHM-SD-SD011-0002 looking northwest.

photo 6



Sediment sample GHM-SD-SD011-0002.

photo 7

Collecting sediment samples GHM-SD-SD018-0001 with the 2" dredge.

photo 8

Collecting sediment sample GHM-SD-SD019-0001 looking southwest.

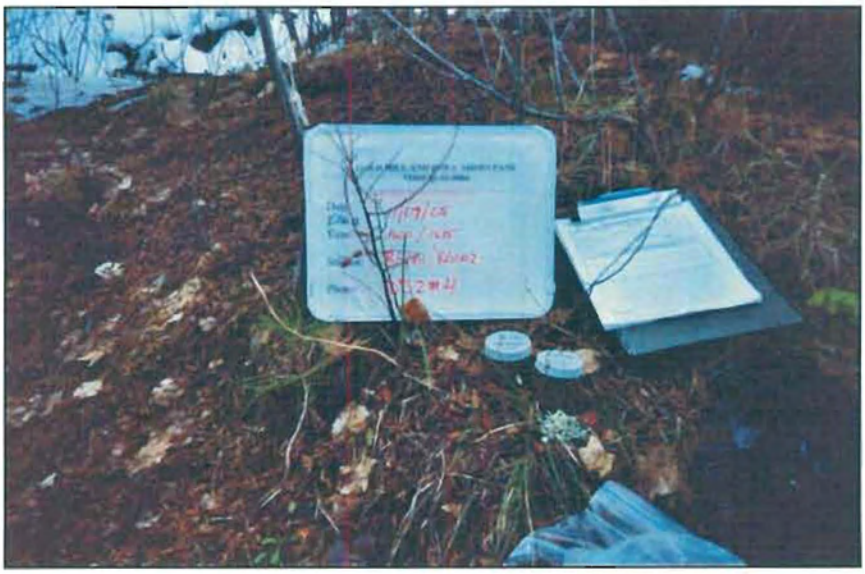
Photolog

06-0018 Photolog.ai

photo 9

Collecting background sediment GHM-SS-BG001-0003.

photo 10



Background sediment sample GHM-SS-BG001-0003 and background soil sample GHM-SD-BG002-0004.

Photolog

06-0018 Photolog.ai

photo 11

Collecting screening samples at top of Gold Hill Waste Pile #2.

photo 12

Gold Hill Waste Pile #2 looking north.

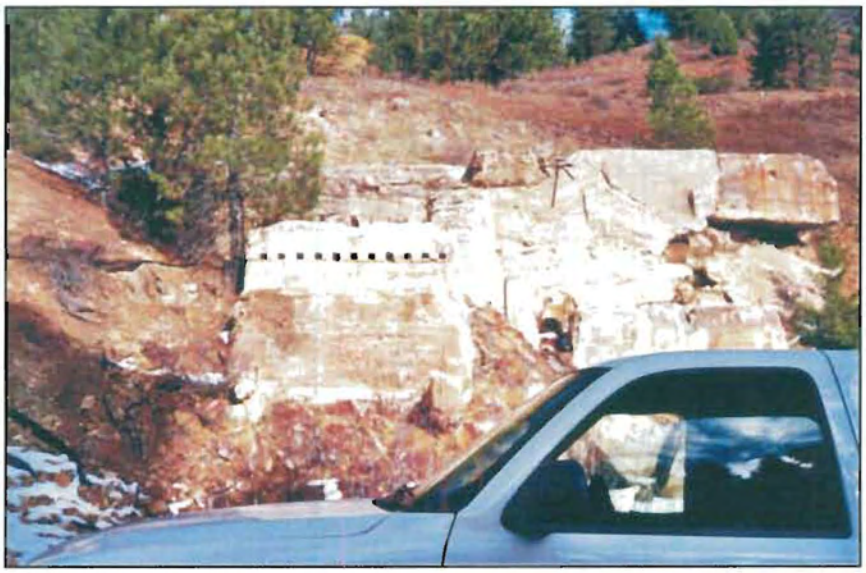
Photolog

06-0018 Photolog.ai

photo 13

Overview of the Gold Hill Mill Site looking north.

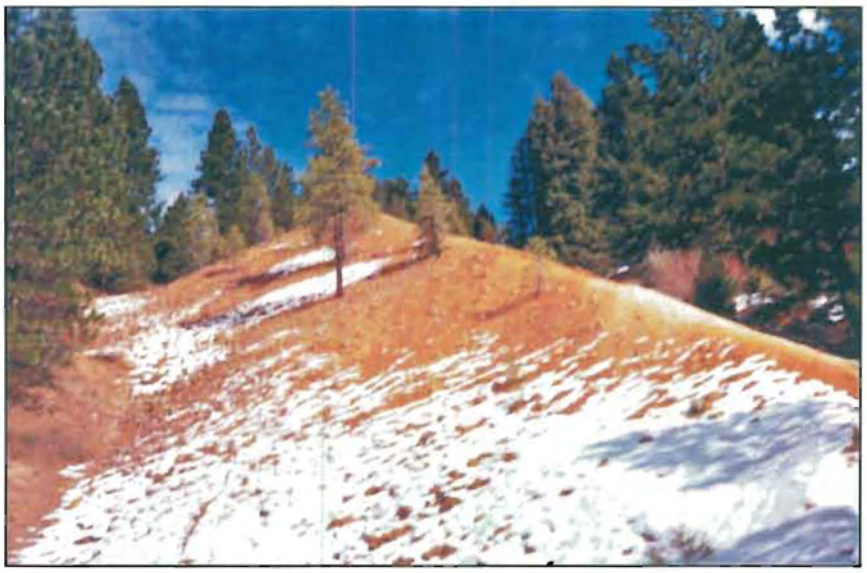
photo 14



Views of Gold Hill Mill looking east.

Photolog

photo 15



Gold Hill Waste Pile #1 looking northeast.

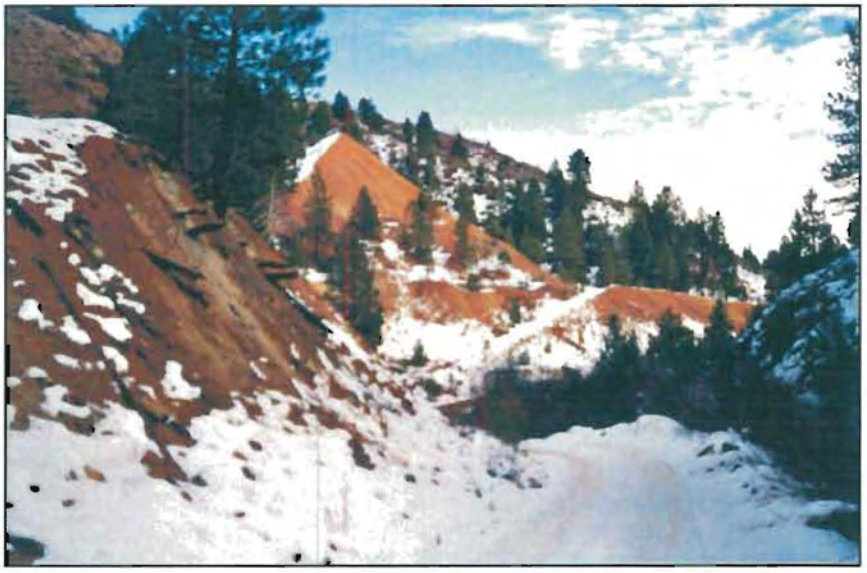
photo 16

Gold Hill Waste Pile #1 from the road looking northeast.

photo 17

Views of Iowa Mine Waste Piles looking northeast.

photo 18



Looking south toward Gold Hill Waste Pile #2.

photo 19

Looking south toward Gold Hill Mill Site.

APPENDIX B

GPS CORRDINATES—UNCORRECTED AND CORRECTED

GPS Coordinates—Uncorrected and Corrected
Gold Hill and Iowa Mines PA/SI
Boise County, Idaho

START-2 Sample Number	Location Description	GPS File Name	Uncorrected GPS Coordinates		Corrected GPS Coordinates	
			Latitude	Longitude	Latitude	Longitude
GHM-SS-SR001-0003	Gold Hill Mine Waste Pile #2	Not Available	Not Available	Not Available	Not Available	Not Available
GHM-SS-SR002-0003	Gold Hill Mine Waste Pile #2	Not Available	Not Available	Not Available	Not Available	Not Available
GHM-SS-SR003-0003	Gold Hill Mine Mill Location	Not Available	Not Available	Not Available	Not Available	Not Available
GHM-SS-SR004-0003	Gold Hill Mine Waste Pile #1	Not Available	Not Available	Not Available	Not Available	Not Available
GHM-SS-SR005-0003	Gold Hill Mine Waste Pile #1	Not Available	Not Available	Not Available	Not Available	Not Available
GHM-SS-SR006-0003	Iowa Mine Waste Piles	Not Available	Not Available	Not Available	Not Available	Not Available
GHM-SD-SD018-0001	Granite Creek PPE 3 at Toe of Gold Hill Mine Waste Pile #2 (Dredge Sample)	T110919A	43.955931	115.985117	43.95597286	115.9851497
GHM-SD-SD019-0001	Granite Creek PPE 3 at Toe of Gold Hill Mine Waste Pile #2 (Co-located with Sample GHM-SD-SD018-0001)	T110919A	43.955931	115.985117	43.95597286	115.9851497
GHM-SD-SD020-0003	Granite Creek PPE 2 at Toe of Gold Hill Mine Waste Pile #1	T110920A	43.958047	115.986239	43.95795496	115.9861137
GHM-SD-SD022-0001	Granite Creek PPE 1 at Iowa Mine Waste Piles	T110921A	43.962228	115.985106	43.96222654	115.9850956
GHM-SD-SD001-0003	Mores Creek Sediment (Dredge Sample)	T110816B	43.725792	115.953039	43.72576015	115.9530312
GHM-SD-SD002-0003	Mores Creek Sediment (Co-located with Sample GHM-SD-SD001-0003)	T110816B	43.725792	115.953039	43.72576015	115.9530312
GHM-SD-SD003-0001	Mores Creek Sediment (Attribution)	T110817A	43.725972	115.951900	43.72592315	115.9518946
GHM-SD-SD004-0001	Grimes Creek Sediment	T110817B	43.769042	115.980711	43.76890202	115.9805697
GHM-SD-SD005-0001	Grimes Creek Sediment	T110818A	43.805586	115.960933	43.80563641	115.9609405
GHM-SD-SD006-0001	Grimes Creek Sediment	T110818B	43.831192	115.936061	43.83108357	115.9871486
GHM-SD-SD007-0001	Grimes Creek Sediment (Dredge Sample)	T110819A	43.856125	115.932250	43.85617877	115.9321836
GHM-SD-SD008-0001	Grimes Creek Sediment (Co-located with Sample GHM-SD-SD007-0001)	T110819A	43.856125	115.932250	43.85617877	115.9321836
GHM-SD-SD009-0005	Grimes Creek Sediment (Co-located with Sample GHM-SD-SD007-0001)	T110819A	43.856125	115.932250	43.85617877	115.9321836
GHM-SD-SD010-0003	Grimes Creek Sediment	T110820A	43.883253	115.913531	43.88301867	115.9132692
GHM-SD-SD011-0002	Granite Creek Sediment	T110821A	43.914392	115.933842	43.91435194	115.9338152
GHM-SD-SD012-0002	Granite Creek Sediment	Not Available	Not Available	Not Available	Not Available	Not Available
GHM-SD-SD013-0001	Granite Creek Sediment (Dredge Sample)	T110822A	43.927614	115.956017	43.92765176	115.955993
GHM-SD-SD014-0001	Granite Creek Sediment (Co-located with Sample GHM-SD-SD013-0001)	T110822A	43.927614	115.956017	43.92765176	115.955993
GHM-SD-SD015-0003	Granite Creek Sediment (Co-located with Sample GHM-SD-SD013-0001)	T110822A	43.927614	115.956017	43.92765176	115.955993
GHM-SD-SD016-0001	Granite Creek Sediment	T110917A	43.948439	115.978250	43.94860631	115.9783409
GHM-SD-SD017-0001	Granite Creek Sediment	T110917A	43.948439	115.978250	43.94860631	115.9783409
GHM-SD-SD021-0003	Confederate Gulch (Attribution)	T110920B	43.958406	115.986997	43.95838342	115.9871486
GHM-SS-BG001-0003	Background Surface Soil (Unnamed tributary to Granite Creek)	T110922A	43.969922	115.982444	43.9699235	115.9824338
GHM-SD-BG002-0004	Background Sediment (Unnamed tributary to Granite Creek)	T110922A	43.969922	115.982444	43.9699235	115.9824338

APPENDIX C

LABORATORY DATA SHEETS

original
rec'd 12/7/05
per JF

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

December 1, 2005

Reply To
Attn. Of: **OEA-095**

MEMORANDUM

SUBJECT: Data Validation for the Gold Hill & Iowa Mines PA/SI, Case# 34831, SDG: MJ69Y9, Inorganic Analysis

FROM: Donald Matheny, Chemist
Technical Support Unit, OEA

TO: Ken Marcy, Regional Project Manager
Office of Environmental Cleanup

CC: Justen Foslien, Weston Solutions

The data validation of inorganic analyses for the above sample set is complete. Twenty (20) soil/sediment samples were analyzed for total elements by Chemtech Consulting, Mountainside, NJ. Sample numbers for this delivery group are as follows:

MJ69Y9	MJ69Z0	MJ69Z1	MJ69Z2	MJ69Z3	MJ69Z4	MJ69Z5
MJ69Z6	MJ69Z7	MJ69Z8	MJ69Z9	MJ6A00	MJ6A01	MJ6A02
MJ6A03	MJ6A04	MJ6A05	MJ6A06	MJ6A07	MJ6A08	

DATA QUALIFICATIONS

The following comments refer to the lab's performance in meeting the quality control specifications outlined in the "CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILM05.3", the "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA-540/R-94-013" and the judgment of the reviewer. The comments presented herein are based on the information provided for the review.

1.0 TIMELINESS - Acceptable

The holding time from the date of collection to the date of digestion and analyses were met for all elements (180 days, mercury 28 days). Samples were collected on 11/8/05 thru 11/9/05. ICP-AES analysis was conducted on 11/28/05 and mercury analysis on 11/20/05.

2.0 INSTRUMENT CALIBRATION/VERIFICTION - Acceptable

For ICP-AES analysis, instrument calibration was performed in accordance with method requirements. Recoveries for instrument verification standards (97-108%) met the frequency (10%) and recovery (90-110%) criteria.

For mercury, a blank and five standards were digested for instrument calibration. The correlation coefficient (0.999) met the criterion ($\geq$ 0.995). Recoveries for verification standards (98-111%) met the frequency (10%) and recovery (80-120%) criteria.

Quantitation verification standards met both the frequency and recovery ($\pm$ 30-50%) criteria for all elements.

3.0 ICP-AES INTERFERENCE CHECK SAMPLE (ICS) - Acceptable

An ICS was analyzed at the required frequency for each analytical run. ICS recoveries met the recovery criterion (80-120% or $\pm$ 2xCRDL) for all elements.

4.0 LABORATORY CONTROL SAMPLES (LCS) - Acceptable

A Solid Laboratory Control Sample was digested and analyzed. All elements were recovered within the control limits for soils.

5.0 BLANKS

Preparation and instrument control blanks were prepared and analyzed in accordance with method requirements. Blank results were either non-detected or below a factor that could impact analytical sample results with the exception of nickel. Affected samples were qualified (U) for nickel.

6.0 MATRIX SPIKE ANALYSIS - Acceptable

A matrix spike was analyzed for sample MJ69Y9. Percent recoveries (76-104%) met the recovery limits (75-125%) for all elements.

7.0 DUPLICATE SAMPLE ANALYSIS - Acceptable

A duplicate sample was analyzed for sample MJ69Y9. Relative percent differences ($\leq$ 26%) were within the soils assessment criteria ($\pm$ 35% or $\pm$ 2xCRDL).

8.0 ICP-AES SERIAL DILUTION - Acceptable

A five-fold serial dilution was analyzed for sample MJ69Y9. Percent differences ($\leq$ 3%) met the control limits ($\leq$ 10%) for all applicable elements.

9.0 ASSESSMENT SUMMARY

The following is a summary of qualified data:

A number of reported values for nickel were qualified (U) due to the detected presence of this analyte in the preparation and/or instrument verification blanks.

In accordance with the project requirements, sample digestion logs indicate that samples for both mercury and ICP-EAS analysis were digested using aqua regia.

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. The analyte may or may not be present in the sample.

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

PROJECT SPECIFIC DATA QUALIFIERS:

L - Low bias.

H - High bias.

K - Unknown Bias.

B - Estimated below the Contract Required Quantitation Limit.

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Y9

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-01

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 76.1

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1030			P	
7440-36-0	Antimony	7.9	U		P	U
7440-38-2	Arsenic	5.0			P	
7440-39-3	Barium	22.7	J	B	P	BJK
7440-41-7	Beryllium	0.08	J	B	P	
7440-43-9	Cadmium	0.13	J	B	P	
7440-70-2	Calcium	597	J	B	P	
7440-47-3	Chromium	1.9			P	
7440-48-4	Cobalt	1.5	J	B	P	BJK
7440-50-8	Copper	2.7	J	B	P	BJK
7439-89-6	Iron	2800			P	
7439-92-1	Lead	2.2			P	
7439-95-4	Magnesium	456	J	B	P	BJK
7439-96-5	Manganese	226		J	P	
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	1.2	J	B U	P	BJK UJK
7440-09-7	Potassium	287	J	B	P	BJK
7782-49-2	Selenium	0.66	J	B	P	BJK 12-1-05
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	58.6	J	B	P	BJK
7440-28-0	Thallium	3.3	U		P	U
7440-62-2	Vanadium	2.5	J	B	P	BJK
7440-66-6	Zinc	22.4		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z0

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-04

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 76.2

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1170			P	
7440-36-0	Antimony	7.9	U		P	U
7440-38-2	Arsenic	7.0			P	
7440-39-3	Barium	26.0	J	B	P	BJK
7440-41-7	Beryllium	0.13	J	B	P	BJK
7440-43-9	Cadmium	0.15	J	B	P	BJK
7440-70-2	Calcium	839			P	
7440-47-3	Chromium	1.7			P	
7440-48-4	Cobalt	1.6	J	B	P	BJK
7440-50-8	Copper	9.7			P	
7439-89-6	Iron	3540			P	
7439-92-1	Lead	4.5			P	
7439-95-4	Magnesium	599	J	B	P	BJK
7439-96-5	Manganese	211			P	
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	1.1	J	B	P	BJK
7440-09-7	Potassium	318	J	B	P	BJK 12-1-05
7782-49-2	Selenium	1.2	J	B	P	BJK
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	62.4	J	B	P	BJK
7440-28-0	Thallium	3.3	U		P	U
7440-62-2	Vanadium	3.7	J	B	P	BJK
7440-66-6	Zinc	25.6		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z1

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-05

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 78.0

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1160			P	
7440-36-0	Antimony	7.6	U		P	U
7440-38-2	Arsenic	10.0			P	
7440-39-3	Barium	23.1	J	B	P	BJK
7440-41-7	Beryllium	0.10	J	B	P	BJK
7440-43-9	Cadmium	0.63	U		P	U
7440-70-2	Calcium	705			P	
7440-47-3	Chromium	2.1			P	
7440-48-4	Cobalt	1.7	J	B	P	BJK
7440-50-8	Copper	3.4			P	
7439-89-6	Iron	4660			P	
7439-92-1	Lead	3.2			P	
7439-95-4	Magnesium	665			P	
7439-96-5	Manganese	220			P	
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	1.8	J	B	P	BJK
7440-09-7	Potassium	301	J	B	P	BJK 12-1-05
7782-49-2	Selenium	4.4	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	104	J	B	P	BJK
7440-28-0	Thallium	3.2	U		P	U
7440-62-2	Vanadium	3.3	J	B	P	BJK
7440-66-6	Zinc	27.7		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z2

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-06

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 77.1

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1230			P	
7440-36-0	Antimony	7.7	~~U~~		P	U
7440-38-2	Arsenic	6.8			P	
7440-39-3	Barium	26.1			P	
7440-41-7	Beryllium	0.10	~~J~~	~~B~~	P	BJK
7440-43-9	Cadmium	0.14	~~J~~	~~B~~	P	BJK
7440-70-2	Calcium	506	~~J~~	~~B~~	P	BJK
7440-47-3	Chromium	1.5			P	
7440-48-4	Cobalt	1.7	~~J~~	~~B~~	P	BJK
7440-50-8	Copper	2.4	~~J~~	~~B~~	P	BJK
7439-89-6	Iron	3440			P	
7439-92-1	Lead	1.9			P	
7439-95-4	Magnesium	446	~~J~~	~~B~~	P	BJK
7439-96-5	Manganese	208		~~*~~	P	
7439-97-6	Mercury	0.13	~~U~~		CV	U
7440-02-0	Nickel	0.95	~~J~~	~~B~~ ~~U~~	P	UJK
7440-09-7	Potassium	361	~~J~~	~~B~~	P	BJK 12-1-05
7782-49-2	Selenium	0.53	~~J~~	~~B~~	P	BJK
7440-22-4	Silver	1.3	~~U~~		P	U
7440-23-5	Sodium	58.1	~~J~~	~~B~~	P	BJK
7440-28-0	Thallium	3.2	~~U~~		P	U
7440-62-2	Vanadium	3.3	~~J~~	~~B~~	P	BJK
7440-66-6	Zinc	32.9		~~E~~	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z3

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-07

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 78.1

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1480			P	
7440-36-0	Antimony	7.5	U		P	U
7440-38-2	Arsenic	2.8			P	
7440-39-3	Barium	28.3			P	
7440-41-7	Beryllium	0.10	J	B	P	BJK
7440-43-9	Cadmium	0.14	J	B	P	BJK
7440-70-2	Calcium	679			P	
7440-47-3	Chromium	2.0			P	
7440-48-4	Cobalt	1.7	J	B	P	BJK
7440-50-8	Copper	3.5			P	
7439-89-6	Iron	3760			P	
7439-92-1	Lead	2.9			P	
7439-95-4	Magnesium	584	J	B	P	BJK
7439-96-5	Manganese	199			P	
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	0.95	J	B U	P	BJK
7440-09-7	Potassium	412	J	B	P	BJK 12-1-05
7782-49-2	Selenium	4.4	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	60.8	J	B	P	BJK
7440-28-0	Thallium	3.1	U		P	U
7440-62-2	Vanadium	3.8	J	B	P	BJK
7440-66-6	Zinc	37.1		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z4

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-08

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 74.3

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1310			P	
7440-36-0	Antimony	8.0	U		P	U
7440-38-2	Arsenic	3.2			P	
7440-39-3	Barium	28.7			P	
7440-41-7	Beryllium	0.10	J	B	P	BJK
7440-43-9	Cadmium	0.67	U		P	U
7440-70-2	Calcium	568	J	B	P	BJK
7440-47-3	Chromium	1.6			P	
7440-48-4	Cobalt	1.8	J	B	P	BJK
7440-50-8	Copper	2.5	J	B	P	BJK
7439-89-6	Iron	3960			P	
7439-92-1	Lead	2.6			P	
7439-95-4	Magnesium	468	J	B	P	BJK
7439-96-5	Manganese	185		*	P	
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	1.0	J	B U	P	UJK 12-1-05
7440-09-7	Potassium	348	J	B	P	BJK
7782-49-2	Selenium	4.7	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	80.2	J	B	P	BJK
7440-28-0	Thallium	3.3	U		P	U
7440-62-2	Vanadium	3.7	J	B	P	BJK
7440-66-6	Zinc	33.1		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z5

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-09

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 77.3

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	958			P	
7440-36-0	Antimony	7.8	U		P	U
7440-38-2	Arsenic	2.8			P	
7440-39-3	Barium	26.2			P	
7440-41-7	Beryllium	0.21	J	B	P	BJK
7440-43-9	Cadmium	0.14	J	B	P	BJK
7440-70-2	Calcium	514	J	B	P	BJK
7440-47-3	Chromium	1.7			P	
7440-48-4	Cobalt	1.4	J	B	P	BJK
7440-50-8	Copper	10.5			P	
7439-89-6	Iron	2920			P	
7439-92-1	Lead	2.1			P	
7439-95-4	Magnesium	350	J	B	P	BJK
7439-96-5	Manganese	238			P	
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	0.74	J	B U	P	UJK 12-1-05
7440-09-7	Potassium	213	J	B	P	BJK
7782-49-2	Selenium	4.5	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	45.2	J	B	P	BJK
7440-28-0	Thallium	3.2	U		P	U
7440-62-2	Vanadium	3.1	J	B	P	BJK
7440-66-6	Zinc	28.8		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z6

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-10

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 77.2

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1090			P	
7440-36-0	Antimony	7.8	U		P	U
7440-38-2	Arsenic	3.5			P	
7440-39-3	Barium	28.0			P	
7440-41-7	Beryllium	0.14	J	B	P	BJK
7440-43-9	Cadmium	0.21	J	B	P	BJK
7440-70-2	Calcium	546	J	B	P	BJK
7440-47-3	Chromium	2.0			P	
7440-48-4	Cobalt	2.0	J	B	P	BJK
7440-50-8	Copper	2.7	J	B	P	BJK
7439-89-6	Iron	3690			P	
7439-92-1	Lead	2.5			P	
7439-95-4	Magnesium	375	J	B	P	BJK
7439-96-5	Manganese	237		J	P	
7439-97-6	Mercury	0.12	U		CV	U
7440-02-0	Nickel	1.3	J	B U	P	UJK 12-1-05
7440-09-7	Potassium	257	J	B	P	BJK
7782-49-2	Selenium	4.5	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	51.4	J	B	P	BJK
7440-28-0	Thallium	3.2	U		P	U
7440-62-2	Vanadium	4.4	J	B	P	BJK
7440-66-6	Zinc	28.9		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z7

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-11

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 92.5

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2980			P	
7440-36-0	Antimony	6.5	U		P	U
7440-38-2	Arsenic	3.2			P	
7440-39-3	Barium	56.7			P	
7440-41-7	Beryllium	0.20	J	B	P	BJK
7440-43-9	Cadmium	0.16	J	B	P	BJK
7440-70-2	Calcium	897			P	
7440-47-3	Chromium	3.0			P	
7440-48-4	Cobalt	2.5	J	B	P	BJK
7440-50-8	Copper	7.0			P	
7439-89-6	Iron	6030			P	
7439-92-1	Lead	11.8			P	
7439-95-4	Magnesium	962			P	
7439-96-5	Manganese	157			P	
7439-97-6	Mercury	0.11	U		CV	U
7440-02-0	Nickel	1.8	J	B	P	BJK 12-1-05
7440-09-7	Potassium	837			P	
7782-49-2	Selenium	0.46	J	B	P	BJK
7440-22-4	Silver	1.1	U		P	U
7440-23-5	Sodium	73.7	J	B	P	BJK
7440-28-0	Thallium	2.7	U		P	U
7440-62-2	Vanadium	6.9			P	
7440-66-6	Zinc	35.8		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z8

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-12

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 74.7

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1640			P	
7440-36-0	Antimony	8.0	U		P	U
7440-38-2	Arsenic	8.8			P	
7440-39-3	Barium	32.5			P	
7440-41-7	Beryllium	0.13	J	B	P	BJK
7440-43-9	Cadmium	0.20	J	B	P	BJK
7440-70-2	Calcium	613	J	B	P	BJK
7440-47-3	Chromium	2.4			P	
7440-48-4	Cobalt	1.9	J	B	P	BJK
7440-50-8	Copper	5.4			P	
7439-89-6	Iron	5050			P	
7439-92-1	Lead	6.6			P	
7439-95-4	Magnesium	669	J	B	P	BJK
7439-96-5	Manganese	198		*	P	
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	1.0	J	B tt	P	UJK 12-1-05
7440-09-7	Potassium	422	J	B	P	BJK
7782-49-2	Selenium	4.7	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	65.5	J	B	P	BJK
7440-28-0	Thallium	3.3	U		P	U
7440-62-2	Vanadium	4.7	J	B	P	BJK
7440-66-6	Zinc	42.3		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ69Z9

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-13

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 75.9

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1030			P	
7440-36-0	Antimony	7.8	U		P	U
7440-38-2	Arsenic	2.8			P	
7440-39-3	Barium	22.6	J	B	P	BJK
7440-41-7	Beryllium	0.08	J	B	P	BJK
7440-43-9	Cadmium	0.65	U		P	U
7440-70-2	Calcium	530	J	B	P	BJK
7440-47-3	Chromium	2.9			P	
7440-48-4	Cobalt	1.5	J	B	P	BJK
7440-50-8	Copper	3.0	J	B	P	BJK
7439-89-6	Iron	3310			P	
7439-92-1	Lead	0.85	J	B	P	BJK
7439-95-4	Magnesium	406	J	B	P	BJK
7439-96-5	Manganese	151		*	P	
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	1.0	J	B U	P	UJK 12-1-05
7440-09-7	Potassium	206	J	B	P	BJK
7782-49-2	Selenium	4.5	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	69.7	J	B	P	BJK
7440-28-0	Thallium	3.2	U		P	U
7440-62-2	Vanadium	4.2	J	B	P	BJK
7440-66-6	Zinc	31.9		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A00

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-14

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 75.5

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2290			P	
7440-36-0	Antimony	7.8	~~U~~		P	U
7440-38-2	Arsenic	2.7			P	
7440-39-3	Barium	46.7			P	
7440-41-7	Beryllium	0.10	~~J~~	~~B~~	P	BJK
7440-43-9	Cadmium	0.65	~~U~~		P	U
7440-70-2	Calcium	946			P	
7440-47-3	Chromium	2.0			P	
7440-48-4	Cobalt	2.8	~~J~~	~~B~~	P	BJK
7440-50-8	Copper	4.5			P	
7439-89-6	Iron	5690			P	
7439-92-1	Lead	1.6			P	
7439-95-4	Magnesium	1020			P	
7439-96-5	Manganese	166		~~*~~	P	
7439-97-6	Mercury	0.13	~~U~~		CV	U DM 12-1-05
7440-02-0	Nickel	3.8	~~J~~	~~B~~	P	UJK
7440-09-7	Potassium	528	~~J~~	~~B~~	P	BJK
7782-49-2	Selenium	0.77	~~J~~	~~B~~	P	BJK
7440-22-4	Silver	1.3	~~U~~		P	U
7440-23-5	Sodium	93.5	~~J~~	~~B~~	P	BJK
7440-28-0	Thallium	3.2	~~U~~		P	U
7440-62-2	Vanadium	6.4	~~J~~	~~B~~	P	BJK
7440-66-6	Zinc	43.9		~~E~~	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A01

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-15

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 74.7

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2290			P	
7440-36-0	Antimony	8.0	~~U~~		P	U
7440-38-2	Arsenic	3.1			P	
7440-39-3	Barium	56.6			P	
7440-41-7	Beryllium	0.10	~~J~~	~~B~~	P	BJK
7440-43-9	Cadmium	0.26	~~J~~	~~B~~	P	BJK
7440-70-2	Calcium	973			P	
7440-47-3	Chromium	1.9			P	
7440-48-4	Cobalt	3.4	~~J~~	~~B~~	P	BJK
7440-50-8	Copper	4.5			P	
7439-89-6	Iron	6870			P	
7439-92-1	Lead	2.6			P	
7439-95-4	Magnesium	917			P	
7439-96-5	Manganese	498		~~J~~	P	
7439-97-6	Mercury	0.13	~~U~~		CV	U DM 12-1-05
7440-02-0	Nickel	4.3	~~J~~	~~B~~	P	UJK
7440-09-7	Potassium	670			P	
7782-49-2	Selenium	4.6	~~U~~		P	U
7440-22-4	Silver	1.3	~~U~~		P	U
7440-23-5	Sodium	112	~~J~~	~~B~~	P	BJK
7440-28-0	Thallium	3.3	~~U~~		P	~~B~~ U
7440-62-2	Vanadium	8.3			P	
7440-66-6	Zinc	53.1		~~E~~	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A02

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-16

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 75.0

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3080			P	
7440-36-0	Antimony	7.8	U		P	U
7440-38-2	Arsenic	1.7			P	
7440-39-3	Barium	61.5			P	
7440-41-7	Beryllium	0.12	J	B	P	BJK
7440-43-9	Cadmium	0.22	J	B	P	BJK
7440-70-2	Calcium	1280			P	
7440-47-3	Chromium	2.2			P	
7440-48-4	Cobalt	2.8	J	B	P	BJK
7440-50-8	Copper	1.8	J	B	P	BJK
7439-89-6	Iron	6800			P	
7439-92-1	Lead	0.65	J	B	P	BJK
7439-95-4	Magnesium	1290			P	
7439-96-5	Manganese	210		*	P	
7439-97-6	Mercury	0.13	U		CV	U DM
7440-02-0	Nickel	3.0	J	B U	P	UJK12-1-05
7440-09-7	Potassium	1060			P	
7782-49-2	Selenium	4.6	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	106	J	B	P	BJK
7440-28-0	Thallium	3.3	U		P	U
7440-62-2	Vanadium	7.3			P	
7440-66-6	Zinc	55.6		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A03

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-17

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 92.9

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6340			P	
7440-36-0	Antimony	6.5	U		P	U
7440-38-2	Arsenic	3.4			P	
7440-39-3	Barium	108			P	
7440-41-7	Beryllium	0.29	J	B	P	BJK
7440-43-9	Cadmium	0.38	J	B	P	BJK
7440-70-2	Calcium	2650			P	
7440-47-3	Chromium	14.8			P	
7440-48-4	Cobalt	8.0			P	
7440-50-8	Copper	13.5			P	
7439-89-6	Iron	15700			P	
7439-92-1	Lead	3.4			P	
7439-95-4	Magnesium	4810			P	
7439-96-5	Manganese	151			P	
7439-97-6	Mercury	0.11	U		CV	U DM 12-1-05
7440-02-0	Nickel	20.5			P	
7440-09-7	Potassium	763			P	
7782-49-2	Selenium	3.8	U		P	U
7440-22-4	Silver	1.1	U		P	U
7440-23-5	Sodium	289	J	B	P	BJK
7440-28-0	Thallium	2.7	U		P	U
7440-62-2	Vanadium	21.8			P	
7440-66-6	Zinc	66.3		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A04

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-18

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 78.2

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2520			P	
7440-36-0	Antimony	7.7	U		P	U
7440-38-2	Arsenic	3.1			P	
7440-39-3	Barium	56.5			P	
7440-41-7	Beryllium	0.10	J	B	P	BJK
7440-43-9	Cadmium	0.21	J	B	P	BJK
7440-70-2	Calcium	1010			P	
7440-47-3	Chromium	2.3			P	
7440-48-4	Cobalt	2.5	J	B	P	BJK
7440-50-8	Copper	2.2	J	B	P	BJK
7439-89-6	Iron	7640			P	
7439-92-1	Lead	1.3	J	B	P	BJK
7439-95-4	Magnesium	1080			P	
7439-96-5	Manganese	167		✓	P	
7439-97-6	Mercury	0.13	U		CV	U DM
7440-02-0	Nickel	3.2	J	B ✓	P	UJK 12-1-05
7440-09-7	Potassium	855			P	
7782-49-2	Selenium	4.5	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	113	J	B	P	BJK
7440-28-0	Thallium	3.2	U		P	U
7440-62-2	Vanadium	9.0			P	
7440-66-6	Zinc	51.2		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A05

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-19

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 78.1

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2220			P	
7440-36-0	Antimony	7.7	U		P	U
7440-38-2	Arsenic	21.5			P	
7440-39-3	Barium	77.2			P	
7440-41-7	Beryllium	0.19	J	B	P	BJK
7440-43-9	Cadmium	0.70			P	
7440-70-2	Calcium	824			P	
7440-47-3	Chromium	3.5			P	
7440-48-4	Cobalt	4.3	J	B	P	BJK
7440-50-8	Copper	6.2			P	
7439-89-6	Iron	9760			P	
7439-92-1	Lead	13.5			P	
7439-95-4	Magnesium	505	J	B	P	BJK
7439-96-5	Manganese	1260		*	P	
7439-97-6	Mercury	0.22			CV	DM
7440-02-0	Nickel	2.4	J	B U	P	UJK 12-1-05
7440-09-7	Potassium	274	J	B	P	BJK
7782-49-2	Selenium	4.5	U		P	U
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	60.1	J	B	P	BJK
7440-28-0	Thallium	1.2	J	B	P	BJK
7440-62-2	Vanadium	4.4	J	B	P	BJK
7440-66-6	Zinc	176		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A06

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-20

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 74.2

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3260			P	
7440-36-0	Antimony	8.0	~~U~~		P	U
7440-38-2	Arsenic	76.5			P	
7440-39-3	Barium	78.9			P	
7440-41-7	Beryllium	0.17	~~J~~	~~B~~	P	BJK
7440-43-9	Cadmium	0.65	~~J~~	~~B~~	P	BJK
7440-70-2	Calcium	1180			P	
7440-47-3	Chromium	7.9			P	
7440-48-4	Cobalt	2.8	~~J~~	~~B~~	P	BJK
7440-50-8	Copper	4.5			P	
7439-89-6	Iron	17100			P	
7439-92-1	Lead	24.5			P	
7439-95-4	Magnesium	1300			P	
7439-96-5	Manganese	886		~~*~~	P	
7439-97-6	Mercury	0.16			CV	DM
7440-02-0	Nickel	1.6	~~J~~	~~B~~ ~~U~~	P	UJK 12-1-05
7440-09-7	Potassium	829			P	
7782-49-2	Selenium	4.7	~~U~~		P	U
7440-22-4	Silver	1.3	~~U~~		P	U
7440-23-5	Sodium	93.8	~~J~~	~~B~~	P	BJK
7440-28-0	Thallium	3.3	~~U~~		P	U
7440-62-2	Vanadium	5.9	~~J~~	~~B~~	P	BJK
7440-66-6	Zinc	151		~~E~~	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
MJ6A07

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-21

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 71.8

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2980			P	
7440-36-0	Antimony	8.4	U		P	U
7440-38-2	Arsenic	69.4			P	
7440-39-3	Barium	97.9			P	
7440-41-7	Beryllium	0.19	J	B	P	BJK
7440-43-9	Cadmium	0.83			P	
7440-70-2	Calcium	1560			P	
7440-47-3	Chromium	2.2			P	
7440-48-4	Cobalt	3.1	J	B	P	BJK
7440-50-8	Copper	4.2			P	
7439-89-6	Iron	22400			P	
7439-92-1	Lead	24.8			P	
7439-95-4	Magnesium	896			P	
7439-96-5	Manganese	972			P	
7439-97-6	Mercury	0.15			CV	
7440-02-0	Nickel	2.3	J	B	P	UJK 12-1-05
7440-09-7	Potassium	798			P	
7782-49-2	Selenium	4.9	U		P	U
7440-22-4	Silver	1.4	U		P	U
7440-23-5	Sodium	79.3	J	B	P	BJK
7440-28-0	Thallium	3.5	U		P	U
7440-62-2	Vanadium	5.9	J	B	P	BJK
7440-66-6	Zinc	173		E	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A08

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ69Y9

Matrix: (soil/water) SOIL Lab Sample ID: T5697-22

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 75.3

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2510			P	
7440-36-0	Antimony	8.0	~~U~~		P	U
7440-38-2	Arsenic	12.0			P	
7440-39-3	Barium	59.2			P	
7440-41-7	Beryllium	0.13	~~J~~	~~B~~	P	BJK
7440-43-9	Cadmium	0.27	~~J~~	~~B~~	P	BJK
7440-70-2	Calcium	1020			P	
7440-47-3	Chromium	1.5			P	
7440-48-4	Cobalt	1.8	~~J~~	~~B~~	P	BJK
7440-50-8	Copper	2.2	~~J~~	~~B~~	P	BJK
7439-89-6	Iron	11800			P	
7439-92-1	Lead	5.0			P	
7439-95-4	Magnesium	887			P	
7439-96-5	Manganese	483		~~*~~	P	
7439-97-6	Mercury	0.07	~~J~~	~~B~~	CV	BJK RW
7440-02-0	Nickel	1.0	~~J~~	~~B~~ ~~*~~	P	UJK 1-05
7440-09-7	Potassium	762			P	
7782-49-2	Selenium	4.6	~~U~~		P	U
7440-22-4	Silver	1.3	~~U~~		P	U
7440-23-5	Sodium	76.5	~~J~~	~~B~~	P	BJK
7440-28-0	Thallium	3.3	~~U~~		P	U
7440-62-2	Vanadium	4.9	~~J~~	~~B~~	P	BJK
7440-66-6	Zinc	67.3		~~E~~	P	
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05

Original rec'd 12/7/05 per JF

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

December 5, 2005

Reply To
Attn. Of: **OEA-095**

MEMORANDUM

SUBJECT: Data Validation for the Gold Hill & Iowa Mines PA/SI, Case# 34831, SDG: MJ6A09, Inorganic Analysis

FROM: Donald Matheny, Chemist DM
Technical Support Unit, OEA

TO: Ken Marcy, Regional Project Manager
Office of Environmental Cleanup

CC: Justin Foslien, Weston Solutions

The data validation of inorganic analyses for the above sample set is complete. Eleven (11) soil/sediment and three (3) blank water samples were analyzed for total elements by Chemtech Consulting, Mountainside, NJ. Sample numbers for this delivery group are as follows:

MJ6A09	MJ6A10	MJ6A11	MJ6A12	MJ6A13	MJ6A14	MJ6A15
MJ6A16	MJ6A17	MJ6A18	MJ6A19	MJ6A20	MJ6A21	MJ6A22

DATA QUALIFICATIONS

The following comments refer to the lab's performance in meeting the quality control specifications outlined in the "CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILM05.3", the "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA-540/R-94-013" and the judgment of the reviewer. The comments presented herein are based on the information provided for the review.

1.0 TIMELINESS - Acceptable

The holding time from the date of collection to the date of digestion and analyses were met for all elements (180 days, mercury 28 days). Samples were collected on 11/8/05 thru 11/15/05. ICP-AES analysis was conducted on 11/28/05 and mercury analysis on 11/20/05.

2.0 INSTRUMENT CALIBRATION/VERIFICTION - Acceptable

For ICP-AES analysis, instrument calibration was performed in accordance with method requirements. Recoveries for instrument verification standards (97-105%) met the frequency (10%) and recovery (90-110%) criteria.

For mercury, a blank and five standards were digested for instrument calibration. The correlation coefficient (0.999) met the criterion ($\geq$ 0.995). Recoveries for verification standards (98-112%) met the frequency (10%) and recovery (80-120%) criteria.

Quantitation verification standards met both the frequency and recovery ($\pm$ 30-50%) criteria for all elements.

3.0 ICP-AES INTERFERENCE CHECK SAMPLE (ICS) - Acceptable

An ICS was analyzed at the required frequency for each analytical run. ICS recoveries met the recovery criterion (80-120% or $\pm$ 2xCRDL) for all elements.

4.0 LABORATORY CONTROL SAMPLES (LCS) - Acceptable

An aqueous and solid Laboratory Control Samples were digested and analyzed. All elements were recovered within the control limits for soils and water (80-120%).

5.0 BLANKS

Preparation and instrument control blanks were prepared and analyzed in accordance with method requirements. Blank results were either non-detected or below a factor that could impact analytical sample results with the exception of aluminum, copper, cobalt, iron, magnesium, manganese, nickel and selenium. Affected samples were qualified (U) for these elements.

6.0 MATRIX SPIKE ANALYSIS

A matrix spike was analyzed for sample MJ6A09. Percent recoveries (82-108%) met the recovery limits (75-125%) for all elements with the exception of manganese (126%) and thallium (64%). Manganese data were qualified (JK or UJK) and thallium data were qualified (JL or UJL).

7.0 DUPLICATE SAMPLE ANALYSIS

A duplicate sample was analyzed for sample MJ6A09. Relative percent differences ($\leq$ 31%) were within the soils assessment criteria ($\pm$ 35% or $\pm$ 2xCRDL) with the exception of iron (37%) and manganese (36%). Data for these elements were qualified (JK or UJK).

8.0 ICP-AES SERIAL DILUTION

A five-fold serial dilution was analyzed for sample MJ6A09. Percent differences ($\leq$ 4%) met the control limits ($\leq$ 10%) for all applicable elements with the exception of zinc (14%). Zinc data were qualified (JL) and may be biased low.

9.0 ASSESSMENT SUMMARY

The following is a summary of qualified data:

A number of reported values for aluminum, copper, cobalt, iron, magnesium, manganese, nickel and selenium were qualified (U) due to the detected presence of these analytes in the preparation and/or instrument verification blanks.

Manganese data were qualified (JK or UJK) due to exceedances within the matrix spike and duplicate sample analyses. Bias for manganese values could not be determined.

Thallium data were qualified (JL or UJL) due to a low spike recovery. Thallium values may be biased low.

Iron data were qualified (JK) due to an exceedance of the duplicate sample analysis. Bias for iron values could not be determined.

Zinc data were qualified (JL) due to a high percent difference in the serial dilution analysis. Zinc values may be biased low.

In accordance with the project requirements, sample digestion logs indicate that soil samples for both mercury and ICP-EAS analysis were digested using aqua regia.

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. The analyte may or may not be present in the sample.

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

PROJECT SPECIFIC DATA QUALIFIERS:

L - Low bias.

H - High bias.

K - Unknown Bias.

B - Estimated below the Contract Required Quantitation Limit.

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A09

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-01

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 75.6

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2020			P	
7440-36-0	Antimony	7.9	U		P	U
7440-38-2	Arsenic	1.8			P	
7440-39-3	Barium	43.1			P	
7440-41-7	Beryllium	0.11		B	P	BJK
7440-43-9	Cadmium	0.22		B	P	
7440-70-2	Calcium	629		B	P	
7440-47-3	Chromium	0.99		B	P	
7440-48-4	Cobalt	1.3		B	P	
7440-50-8	Copper	1.7		B	P	
7439-89-6	Iron	5200		J	P	JK
7439-92-1	Lead	4.9			P	
7439-95-4	Magnesium	674			P	
7439-96-5	Manganese	62.6		J	P	JK JH
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	0.79		U	P	UJK
7440-09-7	Potassium	594		B	P	BJK
7782-49-2	Selenium	0.50		U	P	UJK 12-5-05
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	60.9		B	P	BJK
7440-28-0	Thallium	3.3	U	UJ	P	UJK
7440-62-2	Vanadium	3.6		B	P	BJK
7440-66-6	Zinc	49.3		J	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts: B

Comments:

JAN 26 2006

RW 12/08/05

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A10

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-04

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 75.3

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4000		~~J~~	P	
7440-36-0	Antimony	8.0	~~U~~		P	U
7440-38-2	Arsenic	11.1			P	
7440-39-3	Barium	45.8			P	
7440-41-7	Beryllium	0.13	~~J~~	~~B~~	P	BJK
7440-43-9	Cadmium	0.25	~~J~~	~~B~~	P	BJK
7440-70-2	Calcium	814			P	
7440-47-3	Chromium	13.1			P	
7440-48-4	Cobalt	3.2	~~J~~	~~B~~	P	BJK
7440-50-8	Copper	3.7			P	
7439-89-6	Iron	9570		~~J~~ ~~JK~~	P	JK
7439-92-1	Lead	12.2			P	
7439-95-4	Magnesium	2060			P	
7439-96-5	Manganese	77.2		~~J~~ ~~JK~~	P	JKJH
7439-97-6	Mercury	0.33			CV	
7440-02-0	Nickel	6.0			P	
7440-09-7	Potassium	721			P	
7782-49-2	Selenium	4.6	~~U~~		P	U DM
7440-22-4	Silver	0.26	~~J~~	~~B~~	P	BJK 12-5-05
7440-23-5	Sodium	82.8	~~J~~	~~B~~	P	BJK
7440-28-0	Thallium	3.3	~~U~~	~~J~~ ~~UJL~~	P	UJK
7440-62-2	Vanadium	7.8			P	
7440-66-6	Zinc	89.1		~~J~~ ~~JL~~	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

B

JAN 2 6 2006

12/08/05

FORM IA-IN ILM05.3

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A11

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-05

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 77.0

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2550		J	P	
7440-36-0	Antimony	7.8	U		P	UJK
7440-38-2	Arsenic	0.70	J	B	P	BJK
7440-39-3	Barium	68.1			P	
7440-41-7	Beryllium	0.13	J	B	P	BJK
7440-43-9	Cadmium	0.65	U		P	U
7440-70-2	Calcium	782			P	
7440-47-3	Chromium	2.2			P	
7440-48-4	Cobalt	1.5	J	B	P	BJK
7440-50-8	Copper	1.4	J	B	P	BJK
7439-89-6	Iron	5350		J JK	P	JK
7439-92-1	Lead	2.6			P	
7439-95-4	Magnesium	759			P	
7439-96-5	Manganese	118		N JK	P	JKJH
7439-97-6	Mercury	0.13	U		CV	U
7440-02-0	Nickel	0.94	J	UJ	P	UJK
7440-09-7	Potassium	660			P	
7782-49-2	Selenium	4.5	U		P	U DM 12-5-05
7440-22-4	Silver	1.3	U		P	U
7440-23-5	Sodium	83.2	J	B	P	BJK
7440-28-0	Thallium	3.2	U	N UJK	P	UJK
7440-62-2	Vanadium	3.9	J	B	P	BJK
7440-66-6	Zinc	31.3		E JK	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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JAN 26 2006

12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A12

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-06

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 81.7

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6750			P	
7440-36-0	Antimony	7.2	U		P	U
7440-38-2	Arsenic	3.5			P	
7440-39-3	Barium	164			P	
7440-41-7	Beryllium	0.38		B	P	BJK
7440-43-9	Cadmium	0.28		B	P	BJK
7440-70-2	Calcium	1220			P	
7440-47-3	Chromium	5.3			P	
7440-48-4	Cobalt	4.2		B	P	BJK
7440-50-8	Copper	4.5			P	
7439-89-6	Iron	10300		JK	P	JK
7439-92-1	Lead	7.1			P	
7439-95-4	Magnesium	1500			P	
7439-96-5	Manganese	412		JK	P	JKSH
7439-97-6	Mercury	0.12	U		CV	U
7440-02-0	Nickel	2.9		U	P	UJK
7440-09-7	Potassium	1710			P	
7782-49-2	Selenium	0.91		U	P	UJK DM 12-5-05
7440-22-4	Silver	1.2	U		P	U
7440-23-5	Sodium	81.0		B	P	BJK
7440-28-0	Thallium	3.0	U	UJL	P	UJK
7440-62-2	Vanadium	12.4			P	
7440-66-6	Zinc	63.6		JL	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

JAN 26 2006

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A13

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-07

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 89.7

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	653			P	
7440-36-0	Antimony	1.1	J	B	P	BJK
7440-38-2	Arsenic	112			P	
7440-39-3	Barium	46.9			P	
7440-41-7	Beryllium	0.55	U		P	U
7440-43-9	Cadmium	0.17	J	B	P	BJK
7440-70-2	Calcium	209	J	B	P	BJK
7440-47-3	Chromium	1.1	U		P	U
7440-48-4	Cobalt	0.23	J	UJ	P	UJK
7440-50-8	Copper	5.5			P	
7439-89-6	Iron	8790		J JK	P	JK
7439-92-1	Lead	209			P	
7439-95-4	Magnesium	197	J	B	P	BJK
7439-96-5	Manganese	15.0		N JK	P	JK JH
7439-97-6	Mercury	0.16			CV	
7440-02-0	Nickel	0.16	J	UJ	P	UJK
7440-09-7	Potassium	412	J	B	P	BJK
7782-49-2	Selenium	0.43	J	UJ	P	UJK 12-5-05
7440-22-4	Silver	7.3			P	
7440-23-5	Sodium	93.6	J	B	P	BJK
7440-28-0	Thallium	2.8	U	N UJ	P	UJK
7440-62-2	Vanadium	0.92	J	B	P	BJK
7440-66-6	Zinc	32.3		E JL	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

JAN 2 6 2006

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A14

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-08

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 87.2

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	529		J	P	
7440-36-0	Antimony	2.8	J	B	P	BJK
7440-38-2	Arsenic	120			P	
7440-39-3	Barium	51.7			P	
7440-41-7	Beryllium	0.57	U		P	UJK U
7440-43-9	Cadmium	0.25	J	B	P	BJK
7440-70-2	Calcium	241	J	B	P	BJK
7440-47-3	Chromium	0.26	J	B	P	BJK
7440-48-4	Cobalt	0.30	J	U	P	UJK
7440-50-8	Copper	10.7			P	
7439-89-6	Iron	21800		J JK	P	JK
7439-92-1	Lead	411			P	
7439-95-4	Magnesium	102	J	B	P	BJK
7439-96-5	Manganese	14.0		J JK	P	JK J H
7439-97-6	Mercury	0.64			CV	
7440-02-0	Nickel	0.24	J	U	P	UJK
7440-09-7	Potassium	773			P	
7782-49-2	Selenium	1.3	J	U	P	UJK 12-5-05
7440-22-4	Silver	9.5			P	
7440-23-5	Sodium	170	J	B	P	BJK
7440-28-0	Thallium	2.7	J	J JK	P	JK JK B
7440-62-2	Vanadium	2.3	J	B	P	BJK
7440-66-6	Zinc	52.9		J JK	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A15

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-09

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 85.6

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4690			P	
7440-36-0	Antimony	2.0	J	B	P	BJK
7440-38-2	Arsenic	57.3			P	
7440-39-3	Barium	67.8			P	
7440-41-7	Beryllium	0.53	J	B	P	BJK
7440-43-9	Cadmium	3.6			P	
7440-70-2	Calcium	973			P	
7440-47-3	Chromium	10.7			P	
7440-48-4	Cobalt	5.6	J	B	P	BJK
7440-50-8	Copper	29.1			P	
7439-89-6	Iron	33200		J	P	JK
7439-92-1	Lead	155			P	
7439-95-4	Magnesium	2010			P	
7439-96-5	Manganese	416		J	P	JKJH
7439-97-6	Mercury	0.85			CV	
7440-02-0	Nickel	3.1	J	U	P	UJK
7440-09-7	Potassium	485	J	B	P	BJK
7782-49-2	Selenium	4.0	U		P	U 12-5-05
7440-22-4	Silver	1.7			P	
7440-23-5	Sodium	73.9	J	B	P	BJK
7440-28-0	Thallium	1.3	J	J	P	JKBJKL
7440-62-2	Vanadium	10.8			P	
7440-66-6	Zinc	738		J	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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IA-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
MJ6A16

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-10

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 85.9

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	965		~~J~~	P	
7440-36-0	Antimony	2.7	~~J~~	~~B~~	P	BJK
7440-38-2	Arsenic	118			P	
7440-39-3	Barium	51.5			P	
7440-41-7	Beryllium	0.58	~~U~~		P	U
7440-43-9	Cadmium	0.33	~~J~~	~~B~~	P	BJK
7440-70-2	Calcium	528	~~J~~	~~B~~	P	BJK
7440-47-3	Chromium	1.5			P	
7440-48-4	Cobalt	0.48	~~J~~	~~U~~	P	UJK
7440-50-8	Copper	18.7			P	
7439-89-6	Iron	17100		~~J~~ ~~JK~~	P	JK
7439-92-1	Lead	128			P	
7439-95-4	Magnesium	277	~~J~~	~~B~~	P	BJK
7439-96-5	Manganese	73.0		~~J~~ ~~JK~~	P	JKJH
7439-97-6	Mercury	2.6			CV	
7440-02-0	Nickel	0.74	~~J~~	~~U~~	P	UJK
7440-09-7	Potassium	390	~~J~~	~~B~~	P	BJK
7782-49-2	Selenium	4.1	U		P	12-5-05
7440-22-4	Silver	2.0			P	
7440-23-5	Sodium	131	~~J~~	~~B~~	P	BJK
7440-28-0	Thallium	2.4	~~J~~	~~J~~ ~~JK~~	P	JLB
7440-62-2	Vanadium	2.7	~~J~~	~~B~~	P	BJK
7440-66-6	Zinc	60.3		~~E~~ ~~JK~~	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

JAN 2 6 2006

12/08/05

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A17

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-11

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 88.4

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	500			P	
7440-36-0	Antimony	1.4		B	P	BJK
7440-38-2	Arsenic	94.3			P	
7440-39-3	Barium	28.5			P	
7440-41-7	Beryllium	0.57	U		P	U
7440-43-9	Cadmium	0.12		B	P	BJK
7440-70-2	Calcium	267		B	P	BJK
7440-47-3	Chromium	0.31		B	P	BJK
7440-48-4	Cobalt	0.42			P	UJK
7440-50-8	Copper	7.7			P	
7439-89-6	Iron	10000			P	JK
7439-92-1	Lead	199			P	
7439-95-4	Magnesium	85.0		B	P	BJK
7439-96-5	Manganese	18.3			P	JK JH
7439-97-6	Mercury	0.14			CV	
7440-02-0	Nickel	0.25			P	UJK
7440-09-7	Potassium	383		B	P	BJKDM
7782-49-2	Selenium	0.43			P	UJK 12-5-05
7440-22-4	Silver	4.3			P	
7440-23-5	Sodium	65.6		B	P	BJK
7440-28-0	Thallium	1.5			P	JLB
7440-62-2	Vanadium	0.41		B	P	BJK
7440-66-6	Zinc	45.1			P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

JAN 26 2006

12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A18

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-12

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 86.2

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	791			P	
7440-36-0	Antimony	6.8	U		P	U
7440-38-2	Arsenic	46.1			P	
7440-39-3	Barium	27.0			P	
7440-41-7	Beryllium	0.57	U		P	U
7440-43-9	Cadmium	0.12		B	P	BJK
7440-70-2	Calcium	359		B	P	BJK
7440-47-3	Chromium	0.29		B	P	BJK
7440-48-4	Cobalt	5.7	U		P	U
7440-50-8	Copper	2.4		B	P	BJK
7439-89-6	Iron	4440		JK	P	JK
7439-92-1	Lead	125			P	
7439-95-4	Magnesium	103		B	P	BJK
7439-96-5	Manganese	1.9		UJK	P	UJK
7439-97-6	Mercury	0.12	U		CV	U
7440-02-0	Nickel	0.22		U	P	UJK DM
7440-09-7	Potassium	644			P	
7782-49-2	Selenium	0.61		U	P	UJK 12-5-05
7440-22-4	Silver	1.7			P	
7440-23-5	Sodium	73.1		B	P	BJK
7440-28-0	Thallium	0.89		JL	P	JLB
7440-62-2	Vanadium	0.43		B	P	
7440-66-6	Zinc	12.0		JL	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A19

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) WATER Lab Sample ID: T5698-13

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 0.0

Concentration Units (**ug/L** or **mg/kg** dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	57.1	~~J~~	~~U~~	P	UJK
7440-36-0	Antimony	60.0	~~U~~		P	U
7440-38-2	Arsenic	10.0	~~U~~		P	U
7440-39-3	Barium	1.4	~~J~~	~~B~~	P	BJK
7440-41-7	Beryllium	5.0	~~U~~		P	U
7440-43-9	Cadmium	5.0	~~U~~		P	U
7440-70-2	Calcium	203	~~J~~	~~B~~	P	BJK
7440-47-3	Chromium	10.0	~~U~~		P	U
7440-48-4	Cobalt	50.0	~~U~~		P	U
7440-50-8	Copper	182			P	
7439-89-6	Iron	170		~~U~~	P	UJK
7439-92-1	Lead	22.3			P	
7439-95-4	Magnesium	53.5	~~J~~	~~U~~	P	UJK
7439-96-5	Manganese	15.0	~~U~~		P	U
7439-97-6	Mercury	0.20	~~U~~		CV	U
7440-02-0	Nickel	40.0	~~U~~		P	U
7440-09-7	Potassium	5000	~~U~~		P	U DM 12-5-05
7782-49-2	Selenium	35.0	~~U~~		P	U
7440-22-4	Silver	10.0	~~U~~		P	U
7440-23-5	Sodium	191	~~J~~	~~B~~	P	BJK
7440-28-0	Thallium	7.2	~~J~~	~~B~~	P	BJK
7440-62-2	Vanadium	50.0	~~U~~		P	U
7440-66-6	Zinc	46.7	~~J~~	~~B~~	P	BJK
57-12-5	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

RW 12/08/05

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A20

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) WATER Lab Sample ID: T5698-14

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 0.0

Concentration Units (**ug/L** or **mg/kg** dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	108	J	B	P	BJK
7440-36-0	Antimony	60.0	U		P	U
7440-38-2	Arsenic	10.0	U		P	U
7440-39-3	Barium	3.2	J	B	P	BJK
7440-41-7	Beryllium	5.0	U		P	U
7440-43-9	Cadmium	5.0	U		P	U
7440-70-2	Calcium	807	J	B	P	BJK
7440-47-3	Chromium	10.0	U		P	U
7440-48-4	Cobalt	1.2	J	B	P	BJK
7440-50-8	Copper	3.6	J	K	P	UJK
7439-89-6	Iron	690			P	
7439-92-1	Lead	10.0	U		P	U
7439-95-4	Magnesium	81.3	J	K	P	UJK
7439-96-5	Manganese	34.4			P	
7439-97-6	Mercury	0.20	U		CV	U
7440-02-0	Nickel	40.0	U		P	U
7440-09-7	Potassium	5000	U		P	U DM
7782-49-2	Selenium	35.0	U		P	U 12-5-05
7440-22-4	Silver	10.0	U		P	U
7440-23-5	Sodium	798	J	B	P	BJK
7440-28-0	Thallium	7.2	J	B	P	BJK
7440-62-2	Vanadium	50.0	U		P	U
7440-66-6	Zinc	43.5	J	B	P	BJK
57-12-5	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A21

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) WATER Lab Sample ID: T5698-15

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 0.0

Concentration Units (**ug/L** or **mg/kg** dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15.8	J	U	P	UJK
7440-36-0	Antimony	60.0	U		P	U
7440-38-2	Arsenic	10.0	U		P	U
7440-39-3	Barium	200	U		P	U
7440-41-7	Beryllium	5.0	U		P	U
7440-43-9	Cadmium	5.0	U		P	U
7440-70-2	Calcium	372	J	B	P	BJK
7440-47-3	Chromium	10.0	U		P	U
7440-48-4	Cobalt	1.2	J	B	P	BJK
7440-50-8	Copper	7.6	J	B	P	BJK
7439-89-6	Iron	62.0	J	U	P	UJK
7439-92-1	Lead	10.0	U		P	U
7439-95-4	Magnesium	24.3	J	U	P	UJK
7439-96-5	Manganese	15.0	U		P	U
7439-97-6	Mercury	0.20	U		CV	U
7440-02-0	Nickel	40.0	U		P	U
7440-09-7	Potassium	5000	U		P	U DM 12-5-05
7782-49-2	Selenium	35.0	U		P	U
7440-22-4	Silver	10.0	U		P	U
7440-23-5	Sodium	560	J	B	P	BJK
7440-28-0	Thallium	8.4	J		P	BJK
7440-62-2	Vanadium	50.0	U		P	U
7440-66-6	Zinc	24.7	J	B	P	BJK
57-12-5	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

RW 12/08/05

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ6A22

Lab Name CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 34831 NRAS No.: 1271.0 SDG No.: MJ6A09

Matrix: (soil/water) SOIL Lab Sample ID: T5698-16

Level: (low/med) LOW Date Received: 11/16/2005

% Solids: 86.9

Concentration Units (**ug/L** or **mg/kg** dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	517		J	P	
7440-36-0	Antimony	6.8	U		P	U
7440-38-2	Arsenic	34.7			P	
7440-39-3	Barium	25.9			P	
7440-41-7	Beryllium	0.57	U		P	U
7440-43-9	Cadmium	0.23	J	B	P	BJK
7440-70-2	Calcium	226	J	B	P	BJK
7440-47-3	Chromium	0.88	J	B	P	BJK
7440-48-4	Cobalt	0.37	J	U	P	UJK
7440-50-8	Copper	6.9			P	
7439-89-6	Iron	15100		J+	P	JK
7439-92-1	Lead	69.4			P	
7439-95-4	Magnesium	77.9	J	B	P	BJK
7439-96-5	Manganese	13.3		N+ J+	P	JK
7439-97-6	Mercury	0.58			CV	
7440-02-0	Nickel	0.32	J	U	P	UJK
7440-09-7	Potassium	292	J	B	P	BJK
7782-49-2	Selenium	0.89	J	U	P	UJ 12-5-05
7440-22-4	Silver	1.8			P	
7440-23-5	Sodium	66.8	J	B	P	BJK
7440-28-0	Thallium	1.9	J	N+ J+	P	JL
7440-62-2	Vanadium	1.1	J	B	P	BJK
7440-66-6	Zinc	49.4		*+ J+	P	JK
57-12-5	Cyanide				NR	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

RW 12/08/05